Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Northern Minnesota Medical Association

Hibbing, Minnesota

August 26, 1944

JULY, 1944

Vol. 27 . . . No. 7

40c a copy—$3.00 a year

Printed in U.S.A.

"MY DOCTOR'S MADE A NEW MAN OUTTA BOTH OF US!"

"ALL that endless figuring and re-figuring of milk, carbohydrates, water for feeding formulas was getting my doctor down. 'Specially with all he has to do these days.

"No wonder he looked into S-M-A. An' no wonder he made all his babies S-M-A babies—right off! It sure fixed him up with extra time for his extra work—and even a bit for some sleep. Why, it takes only two minutes to explain to a mother or nurse how to mix and feed S-M-A*.

"Better yet, my doctor knows that in S-M-A he's prescribing an infant food that closely resembles breast milk in digestibility and nutritional completeness!

"Happy am I—and so is Mummy! 'Cause S-M-A made a new man outta me. I'm gaining by leaps and bounds. And Doctor? His new disposition matches *mine*. Believe you me, EVERYBODY'S happy if it's an S-M-A baby!" A nutritional product of the S. M. A. Corporation, Division WYETH Incorporated.

**One S-M-A measuring cup powder to one ounce water.*

S-M-A is derived from tuberculin-tested cows' milk, the fat of which is replaced by animal and vegetable fats, including biologically tested cod liver oil, with milk sugar and potassium chloride added, altogether forming an antirachitic food. When diluted according to directions, S-M-A is essentially similar to human milk in percentages of protein, fat, carbohydrate, ash, in chemical constants of fat and physical properties.

"*Everybody's Happy*

. . . IF IT'S AN SMA BABY!"

REG. U. S. PAT. OFF.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 27 July, 1944 Number 7

THE NEW INTENSIVE MEASURES FOR THE TREATMENT OF EARLY SYPHILIS

PAUL A. O'LEARY, M.D.

Rochester, Minnesota

IN 1935, Chargin, Leifer and Hyman[2] reported their two-year experience with treatment for early syphilis by the five-day intravenous slow-drip method. The procedure was suggested by Chargin as a result of the observations of Hirshfeld, Hyman and Wanger that many of the reactions from intravenous medication were the result of too rapid injection. They expressed the opinion not only that this "speed shock" could be prevented by slow and prolonged administration by intravenous drip but that larger amounts of toxic substances could be given in this manner. The second report in 1939 by Hyman, Chargin and Leifer[5] on the exceptionally well-controlled five-year observations of the five-day treatment materially increased the wave of enthusiasm for it and has now revolutionized the manner of treating early syphilis.

It was natural that many modifications of the five-day plan and new methods of rapidly treating early syphilis would soon develop. It should be remembered that Ehrlich had hoped originally that salvarsan would cure syphilis when given in a single massive dose, but his recommendation as well as those subsequently developed by Hoffman and later Pollitzer was soon discarded because of the high incidence of therapeutic failures. So at the time the Mount Sinai (New York) Hospital group reported on the five-day plan, the treatment of early syphilis was an arduous and expensive undertaking which lasted for eighteen months and required as a minimum thirty injections of arsphenamine and sixty injections of a heavy metal such as bismuth. As syphilotherapists were eager for a simpler, less expensive and technically less difficult program, the recommendation of Chargin and his associates in spite of its excellent clinical and serologic results offered technical objections and complications that prevented its universal adoption.

There are five methods of rapidly treating acute syphilis that I shall discuss, but before doing so, may I emphasize that the final estimation of the value of these methods cannot be made until at least five years and preferably ten years of observation of the treated patients have elapsed since the treatment was completed. Reports of the failures, both clinical and serologic, as well as the complications noted from the treatment should, however, be recorded before the five- and ten-year observations are completed.

The Five-Day Plan

The five-day plan as suggested by Chargin, Leifer and Hyman consists of continuous intravenous injection by the slow-drip method (Murphy drip) of 240 mg. of mapharsen dissolved in 2,400 c.c. of a 5 per cent solution of dextrose. The rate of flow is approximately 3 c.c. per minute, which requires ten to twelve hours to give the entire amount. When the full amount has been given, the needle is withdrawn and the fol-

From the Section on Dermatology and Syphilology, Mayo Clinic, Rochester, Minnesota.

lowing day the procedure is repeated until a total of 1,200 mg. of mapharsen has been given in five days. Neoarsphenamine was employed at first but was discarded because of the high incidence of complications. The use of mapharsen in place of neoarsphenamine has resulted in a marked decrease of the number and types of complications, although these reactions are still high enough to require that the program be carried out in a hospital with personnel trained in the technique of the procedure. It is not a form of treatment that should be given in the office or home by the physician who treats syphilis occasionally. The complications from the five-day plan among 270 patients treated by Chargin, Leifer and Hyman were as follows: there were no deaths from hemorrhagic encephalitis from mapharsen. One death followed the use of neoarsphenamine. Toxic skin eruptions but not exfoliative reactions occurred in 11 per cent, while fever, mild sensory disturbances, usually transitory, and jaundice occurred in 1 per cent or less of the cases.

The results of treatment indicate that 82 per cent of the patients who have been adequately followed up thus far derived an excellent clinical and serologic result. Further observation of this group of patients for five more years will determine the real value of the method.

The Multiple Syringe Technique

One of the early modifications of the five-day plan of treatment recommended by Thomas and Wexler and by Schoch and Alexander working independently of each other, was the use of the multiple syringe technique. Instead of using the drip principle, mapharsen was given by syringe, one or two injections per day being given for varying periods. For example, 100 mg. of mapharsen may be given twice a day for six days or 100 mg. once a day for twelve days. The advantage of this plan has been that the patient may be treated without hospitalization. The disadvantage of the method has been a febrile reaction associated with edema and dermatitis of the face, nausea and vomiting that is more alarming when first encountered than it is serious. Also, hemorrhagic encephalitis and peripheral neuritis occurred frequently enough to necessitate considerable caution in carrying out the plan. The satisfactory results thus far approximate 75 per cent.

Shaffer's Method

Shaffer has conservatively modified the five-day program by adding bismuth to the course. He gives one injection of mapharsen of 180 mg. by the drip method, which requires slightly more than one hour to give. Five injections are given on five consecutive days, following which three injections of bismuth are given the first week and one injection a week is given for four more doses. The satisfactory results from this program also approximate 82 per cent and the complications are not severe.

Eagle and Hogan's Method and Its Modifications

The plan in vogue at the present time in the United States Army was developed by Eagle and Hogan, who, as a result of experimentation on rabbits, recommended that a sufficient amount of mapharsen could be given in twenty-six weeks to produce equally satisfactory clinical and serologic results with but few complications. My experience with this procedure has brought forth two significant points: (1) that the time interval could be decreased materially to six, eight or ten weeks, and (2) that the addition of bismuth therapy decidedly increased the favorable results without adding to the complication rate. At the present time I am employing a modified Eagle system, which consists of three injections of mapharsen and two injections of bismuth per week for eight weeks followed by eight weeks of intramuscular administration of bismuth at the rate of 1 c.c. two times a week. The mapharsen and bismuth courses are repeated following a month's rest period. This program has thus far produced highly satisfactory clinical and serologic results with almost complete absence of complications.

Kendell, Rose and Simpson's Method

Kendell, Rose and Simpson reported in 1939 their experience in the one-day treatment of early syphilis by the simultaneous use of hyperthermy, mapharsen and bismuth. At the present time in two institutions in this country which have been helped financially by the United States Public Health Service the method is undergoing an extensive trial. The patient suffering from early syphilis is given one session in the hyperthermy machine where his temperature is raised on an average to 105.6° F. and maintained for eight

hours. During the fever session he is given 120 mg. of mapharsen intravenously and 75 mg. of bismuth intramuscularly at the beginning and end of the fever course. This is the only treatment that the patient receives, unless he manifests signs of relapse of the disease. In the latter case one of the other intensive treatment programs is instituted.

This startling therapeutic adventure in syphilotherapy is producing results that are less satisfactory than the other methods of treatment[1] and although experience and a well-trained corps of assistants have eliminated some of the kinks in the regimen the mortality rate is still too high to make the procedure practical and safe. The preliminary report on the results of the treatment after nine months' use of the method indicates a favorable outcome in less than 60 per cent of the cases. However, a more prolonged observation period will determine the actual value of the procedure.

Comment

My experience with these various systems for the treatment of early syphilis has brought forth several points that seem worthy of emphasis. From the economic angle, to reduce the period of treatment for early syphilis from eighteen months to five days has been a great advance, and with the newer developments it would appear that the former economic obstacles to treatment, namely time and cost, have been eliminated. Up to the time the five-day plan was recommended, syphilotherapists have been endeavoring to develop a treatment for acute syphilis that could be given in a short period with few complications, that was inexpensive and that was not technically difficult to administer. Most of the new systems of treatment meet the first two of these requirements in that the treatment can be given in a short time, presents few complications in the well-controlled cases and is less expensive than the old method. However, in these new procedures the technical difficulties have been increased materially rather than simplified. The "five-day drip" and the "one-day" plans require hospitalization and a trained crew; the syringe modifications of the drip method may be given while patients are ambulatory, but if hospital facilities are available it is preferable that they be utilized in order to minimize the complications. The modified Eagle or eight-week plan has the advantage of not requiring hospitalization, and the reactions from it are few and mild.

From the scientific aspect, to speak of "cures" for acute syphilis from treatment given in five days or even one day is indeed a dramatic departure from the former eighteen-month ordeal that patients suffering from syphilis were required to undergo. Up to the present, the incidence of favorable serologic and clinical results from the short intensive systems is as high as, and in some reports higher than, from the old prolonged methods. The actual number of persons reported as "cured" in the future will no doubt be much greater because more persons will complete these short courses of treatment. The continued observation of the patients thus far treated by the newer methods is now the paramount part of the evaluation of these systems of treatment, as time is essential for the observation and appraisal of any method advocated for the treatment of early syphilis.

The high incidence of reinfections that have developed after intensive treatment is of particular scientific interest. A discussion of superinfection versus reinfection is too lengthy and unsettled to enter into at this time, but those of us who have been reluctant to recognize second infections of syphilis are now encountering such cases frequently. It appears that the short intensive course prevents the establishment of an immunizing reaction on the part of the host, so that reinfections occur. Other significant points are the high incidence of "cures," practically 100 per cent, among the patients who start the intensive treatment program while still in the seronegative chancre stage, and the equally significant fact that the earlier treatment is started after the appearance of the chancre the higher is the rate of "cure." Likewise the incidence of invasion of the central nervous system is decreased greatly among patients treated by the intensive systems, as evidenced by an incidence of asymptomatic neurosyphilis of approximately 2 per cent. Under the old program between 15 and 25 per cent of the patients manifested signs of invasion of the nervous system.

In approximately 20 per cent of the patients who acquire syphilis malignant complications of the disease eventually develop. In the remainder of the group, in many cases the disease is controlled spontaneously, while in others a small amount of treatment is required to maintain an

asymptomatic state throughout the lifetime of the patient. At this time it appears that the intensive treatment measures now undergoing trial will control the disease quickly and safely in 80 to 90 per cent of the cases, but a percentage similar to that in which treatment failed under the long protracted course will also need subsequent treatment depending on the type of syphilis that eventually develops. However, if treatment for acute syphilis can be given successfully in a week or thereabouts when it formerly required eighteen months and if such treatment can decrease the incidence of late complications, it is, to say the least, a milestone in syphilotherapy.

Penicillin has recently been recommended by Mahoney and others as a satisfactory agent for the treatment of syphilis. The National Research Council created the Subcommittee on Venereal Diseases which is at the moment supervising the appraisal of penicillin in various clinics in this country. Although the first patients were treated only several months ago, the results thus far are sufficient to warrant a continued intensive appraisal of the drug in all phases of syphilis.

References

1. Bundesen, H. N., Bauer, T. J., and Kendell, H. W.: The intensive treatment of gonorrhea and syphilis; organization, objectives, activities and accomplishments of the Chicago Intensive Treatment Center; preliminary report. J.A.M.A., 123:816-820, (Nov. 27) 1943.
2. Chargin, Louis, Leifer, William, and Hyman, H. T.: Studies of velocity and the response to intravenous injections. V. The application of the intravenous drip method to chemotherapy as illustrated by massive doses of arsphenamine in the treatment of early syphilis. J.A.M.A., 104: 878-883, (Mar. 16) 1935.
3. Eagle, Harry and Hogan, R. B.: The intravenous drip and other intensive methods for the treatment of early syphilis. Science, 95:360-362, (Apr. 3) 1942.
4. Hirshfeld, Samuel, Hyman, H. T., and Wanger, J. J.: Influence of velocity on the response to intravenous injections. I. Untoward effects of rapid injection ("speed shock"). Arch. Int. Med., 47:259-287, (Feb.) 1931.
5. Hyman, H. T., Chargin, Louis, and Leifer, William: Massive dose arsenotherapy of syphilis by the intravenous drip method: five-year observations. Am. J. M. Sc., 197:480-485, (Apr.) 1939.
6. Kendell, H. W., Rose, D. L., and Simpson, W. M.: Fever therapy technique in syphilis and gonoccocic infections. Arch. Phys. Therapy, 20:614-619, (Oct.) 1939.
7. Mahoney, J. F., Arnold, R. C., and Harris, Ad: Penicillin treatment of early syphilis; a preliminary report. Am. J. Pub. Health. 33:1387-1391, (Dec.); Ven. Dis. Inform., 24:355-357, (Dec.) 1943.
8. Pollitzer, S.: The principles of the treatment of syphilis. J. Cutan. Dis., 34:633-644, (Sept.) 1916.
9. Schoch, Arthur, and Alexander, L. J.: Short term intensive arsenotherapy of early syphilis; preliminary report. Am. J. Syph., Gonor. & Ven. Dis., 25:607-609, (Sept.) 1941.
10. Shaffer, L. W.: Present status of the intensive arsenotherapy of early syphilis. Ven. Dis. Inform., 24:108-113, (Apr.) 1943.
11. Thomas, E. W., and Wexler, Gertrude: Rapid treatment of early syphilis with multiple injections of mapharsen; preliminary report of 275 cases treated with mapharsen alone and 141 cases treated with mapharsen and fever. Am. J. Pub. Health, 31:545-556, (June) 1941.

PRE-OPERATIVE AND POSTOPERATIVE CARE FOR THE BAD-RISK PATIENT

CLARENCE DENNIS, M.D.

University Hospitals, Minneapolis, Minnesota

THE measures employed in the care of the poor-risk patient on the Surgical Service at the University of Minnesota Hospitals have been developed over a period of years under the stimulation and guidance of Doctor Owen H. Wangensteen, Chief of the Department of Surgery, and the procedures which I shall mention are those which he and those of us who are members of his staff have found most effective.

In any discussion of the care of the "poor-risk" patient, it is essential that we specify just what that term is intended to imply. As far as the present discussion is concerned, we shall deal only incidentally with the emergency case, but shall concentrate upon the patient whose health has been sapped by more chronic conditions.

The causes of the debilitated states about which this discussion centers are roughly: (1) dehydration, (2) malnutrition, (3) starvation, whether due to lack of food or to increased metabolism, (4) prolonged plasma loss with or without whole blood loss, (5) prolonged infection, or (6) any combination of the above items. The specific diseases which may contribute to these factors are represented by: (1) cancer of the stomach or colon with ulceration, (2) pyloric obstruction, whether benign or malignant, (3) chronic bowel obstruction, (4) chronic ulcerative colitis, (5) prolonged infections such as osteomyelitis and Meleney ulcer, (6) the later stages of extensive surface burns, (7) hyperthyroidism, and (8) a host of less common ailments. Diabetic, cardiac, and renal complications are possible additional factors.

We are all, unfortunately, too familiar with patients whose pulse and blood pressure become im-

From the Department of Surgery, University of Minnesota Hospitals, Minneapolis, Minnesota.

perceptible late or even very early in the course of surgical operations, and who require heroic amounts of plasma or blood to avoid catastrophe. There is every reason to believe that this picture can be largely avoided by provision of adequate pre-operative preparation.

Pre-operative Care

This group of patients is difficult to handle because of the likelihood of development of a whole series of complications. Lowered plasma protein levels and inadequate vitamin C intake have been amply proven to interfere with wound healing, to lead to evisceration, and to favor the development of edema. The patient whose water and salt balances are out of line is a candidate for edema, particularly if the plasma protein level is low, and, unhappily, the site of election for the development of edema in the postoperative period is in the lungs, a factor which appears to play a large role in the development of postoperative atelectasis and bronchopneumonia. All of these factors apparently may play a part in the development of further complications, such as postoperative anuria, thrombophlebitis, and embolism.

Water Balance.—Many of these poor-risk patients, particularly those with obstruction in the gastro-intestinal tract, may come to us with clinical dehydration, and this will present the first problem to solve in preparation for operation. As Coller and others have emphasized, the patient in clinical dehydration is 5 to 7 per cent underweight due to fluid loss alone, and the correction of this situation may be achieved by the administration of fluids with this value in mind. Severe dehydration is well treated by administration of 5 per cent of the body weight of fluids parenterally, one-half of this being 0.9 per cent NaCl. As a check on the status of hydration from day to day, Coller has shown that daily weighing of the patient is an invaluable aid, especially in patients in whom parenteral feeding is being employed. Gains of 5 per cent above the usual level are associated ordinarily with clinical edema, and gains of more than 2 or 3 per cent imply impending edema and dictate caution in administration of further fluids. A scale for weighing patients is used on all major surgical cases, both before and after operation, at the University Hospitals, and the information it has given has been a tremendous asset.

Salt Balance.—Improper sodium chloride administration to poor-risk patients may prove as readily fatal as the underlying disease itself. In patients such as those under discussion, excessive salt intake, even if given by mouth, tends to favor water retention, such as edema, ascites, pleural effusion, etc., particularly since the plasma protein level is also usually low.

A markedly low level of plasma chloride may lead to marked and even fatal drops in blood pressure which may respond extremely poorly to transfusion. Patients with diarrhea, vomiting, or large ulcerating surfaces are likely to arrive in a hypochloremic state. For those patients who must be supplied other than by mouth, Coller has devised a very simple rule to determine the amount of sodium chloride which must be given to return the blood level to the normal level of 560 milligrams per 100 c.c. of plasma (expressed in terms of sodium chloride): "for each 100 mg. that the plasma chloride level needs to be raised to reach the normal, the patient should be given 0.5 grams of salt per kilogram of body weight." Most satisfactory returns of blood levels to normal are obtained in those who are relatively acutely ill; those who have been ill for longer times tend to accumulate salt and water abnormally, as in edema and ascites.

When return of the blood chloride level to normal has been accomplished, maintenance may be parenteral, when necessary, and is usually easily accomplished by administration of 5 to 6 grams daily, with extra allowance at the rate of 5 grams per liter for losses due to vomiting, diarrhea, drainage, or gross sweating. The chloride in the urine is easily determined by the Van Slyke titration, and the aim is to keep the daily output between 2 and 7 grams, which assures a safe margin from either over- or under-dosage.

Acidosis and Alkalosis.—The patient may come in a state of marked acidosis or alkalosis, but usually it is found that if adequate salt and water are given and an adequate output of urine is obtained, the situation will be overcome without resort to other measures.

Caloric Requirements—Oral Route.—These patients come to us in states of moderate to severe starvation. It has been felt in the past that most of them, let us take for example the patients with duodenal ulcer or gastric cancer, could not be fed

by mouth because such diets as the first stage Sippy were persistently vomited. Several years ago Wangensteen showed that certain of these patients could be well fed if an inlying nasal gastric tube were used to introduce a liquid formula, thus avoiding entrance into the stomach of several ounces of liquid at a time, often with large amounts of simultaneously swallowed air. In the past year or two, Doctor R. L. Varco, working under Doctor Wangensteen at the University Hospitals, has shown that the great majority of such patients can be well prepared in this fashion, especially if the proper type of diet be employed.

Fig. 1. Scale and stretcher used for weighing patients daily in the early postoperative period. (From Wangensteen: Surg. Gyn. & Obst., 72:257, 1941.)

Varco has developed liquid diets high in protein and carbohydrate and very low in fat content, with a caloric value of about 1.5 calories per c.c., one of which is shown in Table I. After the first day or two, many of these patients can take the diet by mouth and dispense with the nasal tube, but a few need prolonged tube feeding. Usually the liquid formulas can be used as supplements to a solid high-carbohydrate, high-protein, low-fat diet. He usually succeeds in getting 5,000 to 6,000 calories a day into these patients by this means, and in a review of the literature and by studies of his own, he has demonstrated that such measures correct the fatty infiltration of the liver found in the patients under consideration, and lead to elevation of the plasma protein level and deposit of large amounts of carbohydrate and protein in the liver. The rest of us on the staff have been very much impressed with the manner in which such preparation has transformed poor-risk patients to good-risk patients under our eyes. Marked drops in blood pressure during operation, postoperative anuria, ileus, et cetera, have all fallen greatly in frequency since the inception of this regimen. Varco bases the duration of such preparation on the proportion of the body weight the patient has lost since the onset of his illness, using five days if the loss has been 5 to 10 per cent of the body weight, ten to twelve days if it has been 10 to 20 per cent, and three weeks if it has been 25 and 30 per cent.

TABLE I. UNIVERSITY HOSPITAL GASTRIC DIET II.

Carbohydrates	408.8			
Protein	120.4			
Fat	37.2			
Calories	2446			
		Cho	P	F
Whole Egg—6			36.0	36.0
Egg Whites—2			8.0	
Skimmed Milk Powder—4 oz.		58.8	40.4	1.2
*Lactose—300 gms.		300.0		
Skim Milk—1,000 gms.		50.0	36.0	
5 G Salt		408.8	120.4	37.2

†Pre-operative liquid diet devised by Varco and in use at the University Hospitals. (From Varco.4)

*Beet or cane sugar can be substituted.

An adequate vitamine intake is also provided with the diet.

Caloric Requirements—Parenteral Route.—Those remaining patients who genuinely cannot

be prepared by the oral route present a very serious problem indeed. After a trial of 10 per cent glucose by the staff, the author suggested the use of 20 per cent glucose solutions intravenously three to four years ago, and there is little other choice as yet, but this solution is irritating and leads to thrombosis of the veins very readily. Coller has mentioned that 10 per cent glucose must not be given faster than 6 c.c. per minute because of loss in the urine, and we have found that almost none of our patients lose over 15 per cent of the glucose administered as 20 per cent solution if it is given no faster than 3 c.c. a minute.

It is apparent that it will take approximately six hours to administer intravenously 1,000 c.c. of 20 per cent glucose solution at this rate. The needle must therefore be placed, as Coller suggests, away from the elbow, preferably in the midportion of the forearm, so that easy movement is possible and the patient can sit up in a chair or walk about the bed with the infusion running. By this means it is feasible to get 1,200 to 1,600 calories into these patients daily. This may be supplemented by subcutaneous injections of 5 per cent glucose with or without salt, leading to the supplying of 200 to 300 additional calories. Spillage in the urine may be reduced somewhat by partial coverage with insulin added directly to the intravenous fluid. We customarily add also 200 to 300 mg. of cevitamic acid, 20 mg. of thiamine, and 10 c.c. of a crude liver extract.

These patients, of course, suffer at least as much from protein starvation as from lack of carbohydrate, and human plasma thus far is the only agent by which this may be regularly and safely accomplished. The minimum requirement under the circumstance is 300 to 400 c.c. daily.

Hemoglobin.—Most of these patients are anemic and need transfusion to raise the blood hemoglobin level, but the present consensus of opinion seems to be that the hemoglobin level is far less important in the healing of wounds and the general reaction of the patient, except for reaction to certain types of anesthesia, than is the general nutrition.

Use of Suction.—At operation these patients at the University Hospitals regularly have nasal gastric suction tubes in place, for ileus has not been observed in patients who have not been allowed to swallow and retain large quantities of air during and after operation. Nasal suction is ordinarily retained about forty-eight hours, or until abdominal sounds, as heard with the stethoscope,

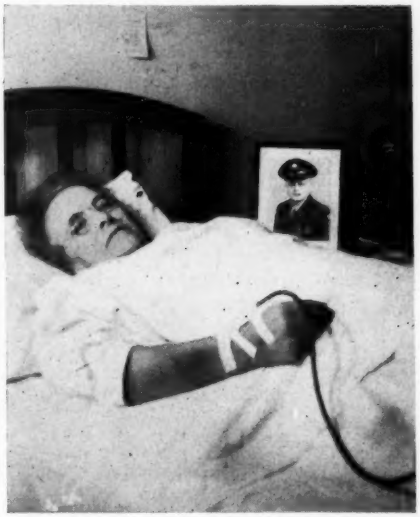

Fig. 2. Manner of giving of fluids intravenously to permit patient freedom of movement during the infusion.

have returned to normal, or the patient has passed gas by rectum.

Prevention of Anuria.—We have felt that postoperative anuria can be best avoided by establishment of adequate nutrition pre-operatively and by induction of a reasonble diuresis in the few hours just prior to operation by the intravenous injection of a liter of 10 per cent glucose solution. During the day of operation, it is customary to give nothing by mouth, but to give a total of about 3,000 c.c. of parenteral fluids containing about 5 grams of sodium chloride. Judicious use of mercurial diuretics may be necessary.

Postoperative Care

General Postoperative Care.—The patient returns to the floor in steep Trendelenberg position, a precaution aimed not only to maintain blood pressure during transport but also to prevent the accumulation of salivary and upper respiratory tract secretions in the lungs. This position is maintained the first twelve hours after operation, preferably with the patient turned half onto his face to promote better drainage. The patient is turned from side to side every two hours, hyper-

ventilated at similar intervals, and encouraged to cough frequently. The Mueller suction apparatus is used freely to keep the mouth and pharynx dry in the first few hours, until reflexes are normal and the danger of aspiration seems lessened. After the first twelve hours, the foot of the bed is kept elevated about 6 inches until the nasal tube has been removed on the third or fourth day. Frequent turning of the patient, hyperventilation, and encouragement to cough are continued also until the tube has been removed. Most important of all, the patient is urged to move arms and legs continuously—1,000 times a day—a measure which, combined with the 6-inch elevation of the foot of the bed, is intended to prevent stasis in the great veins and to lessen the incidence of thrombosis and embolism.

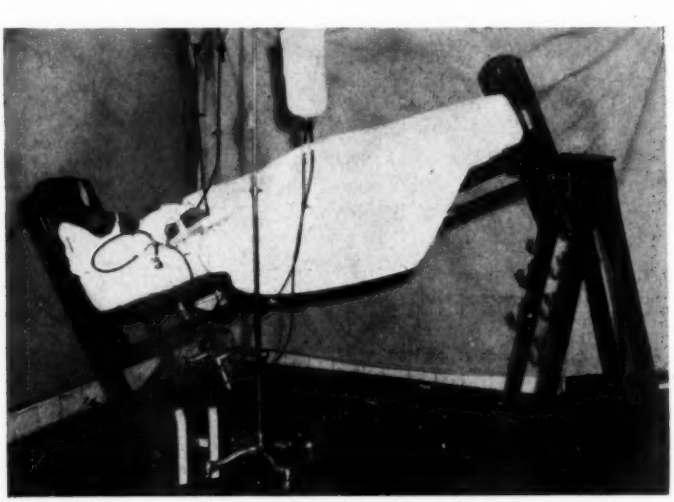

Fig. 3. Steep Trendelenburg position employed in the first twelve to eighteen hours postoperatively, to avoid aspiration of secretions and to favor stabilization of the circulation. (From Wangensteen: Surg. Gyn. & Obst., 72:257, 1941.)

Fluids and Salt in the Postoperative Period.—During the days until normal alimentation has been established, the daily fluids usually given intravenously are 1,500 c.c. of 10 per cent glucose to which vitamins and plasma have been added; This is supplemented with subcutaneous injection of 5 per cent glucose in distilled water, some of which is made up in 0.9 per cent sodium chloride, making a total of about 3,000 c.c. of fluids for the patient daily.

In the ensuing days, careful day-to-day checking of body weights serves as a guide to warn against excessive fluid administration because of inadequate urinary output, in instances in which weight has been gained and edema impends, and to indicate the more free use of fluids if the weight is low. Salt administration is much as already described for the preparation of patients by parenteral means.

The Special Nurse.—In the first two or three postoperative days, there is no measure so productive of good results in the poor-risk patient as the acquisition of nurses who can be in constant attendance. These patients need a host of small attentions in addition to those already mentioned, and, last but not least, a nurse always at hand is an excellent aid to morale.

Inlying Catheter.—Many of these patients fall into the older age group with mild prostatism, and cannot void spontaneously in the immediate postoperative period. In such people, we usually leave inlying Foley catheters for the first three to four days. Administration of a half a gram of sodium sulfadiazene subcutaneously in 100 c.c. of normal saline solution twice daily is a helpful prophylaxis against urinary tract infection.

Feeding.—Following removal of the nasal tube, the patient is kept a day on clear liquids, a day on full liquids, a day on a soft diet, and finally

passes to a general diet. After gastric resection, the diet is also carefully graduated as to quantity the first few days.

Early Ambulation.—We are becoming more and more impressed with the virtues of early ambulation. Good pre-operative preparation and careful silk closure seem to us to justify getting these people out of bed seven days after such operation as gastric or colic resection and sending them home nine days after operation.

Conclusion

Let me stress in conclusion that the time spent in careful pre-operative preparation not only cuts the time till dismissal, but cuts the severity of reaction to operation and the mortality as well. It is only by watching such patients with extreme care throughout and by endeavoring to maintain a good caloric and protein intake throughout, however, that best results can be obtained.

References

1. Coller, F. A., and Maddock, W. G.: Water and electrolyte balance. Surg. Gyn. & Obst., 70:340, 1940.
2. Hartzell, J., Winfield, J. S., and Irvin, J. L.: Plasma vitamin C and serum protein levels in wound disruption. J.A.M.A., 116:669, 1941.
3. Thompson, W. B., Ravdin, I. S., and Frank, I. L.: Effect of hypoproteinemia on wound disruption. Arch. Surg., 36:500, 1938.
4. Varco, R. L.: Pre-operative dietary management for surgical patients. Staff Meeting Bulletin, Hospitals of the University of Minnesota, 15:196, (Jan. 14) 1944.
5. Wangensteen, O. H.: Personal communications.

EARLY DIAGNOSIS OF TUBERCULOSIS

B. J. TERRELL, M.D.
Nopeming, Minnesota

THE same three problems in tuberculosis control are still with us, early diagnosis, adequate treatment and sufficient rehabilitation. This paper will deal with early diagnosis.

The general practitioner still finds 50 per cent of our sanatorium patients. The more he knows about the matter, the earlier his share of these patients will be discovered. The earlier a case is found, the better the prospects of recovery. The trend in early diagnosis leans now towards adult group surveys as against school surveys. For many years we have been trying to set up an efficient and effective case-finding program. This is a problem of great magnitude, because of the great number of persons potentially infected and the difficulty of making an early diagnosis. It is not possible to make a diagnosis of early tuberculosis by physical examination in most cases. Even far advanced tuberculosis is easily missed by the stethoscope. Besides, only sick people come to be examined, and people with early tuberculosis usually are not sick.

Minnesota is one of the leading states in both diagnosis and treatment of tuberculosis, as it is in medicine generally. Minnesota pioneered in the eradication of tuberculosis in cattle, and is leading the fight on human tuberculosis by similar methods of county accreditation, disposal of infectious cases (in humans by segregation and treatment), and widespread educational efforts.

Health propaganda featuring a utopia for our children has always been very successful; and for many years we have been barraged with propaganda in favor of school surveys. I wish to outline the advantages and disadvantages of the school survey system and bring to your attention a method of case-finding which is supplanting the school survey in many parts of the country, and which we cannot afford to neglect.

The idea of a school survey is as follows: (1) administer tuberculin tests to all the children in school; (2) go into the families and neighbors of the positive reactors to determine the positive sputum case who was the source of the child's infection. On the face of it, this sounded like a good idea. We can test with little expense a large group of children. School children are relatively easy to contact, being congregated in school and amenable to the suggestion of teachers; and nobody complains about needles being stuck into school children. Tuberculin is inexpensive. A platinum needle, flame-sterilized, is very convenient. The tests are read in forty-eight hours by nurse or physician. When an unduly large percentage of positive reactors is found, a search is made for a positive sputum case. When too many positives are found in one classroom, the room teacher is

Read at the annual meeting of the Wabasha County Medical Society, Plainview, Minnesota, October 7, 1943.

suspect. When too many positives are found in the entire school, a janitor, cook, or common teacher, such as gymnasium or music teacher, is suspect. When too many positives are found in one school district, the bus driver is suspect. When too many are found in one family, the family contacts are suspect. Similarly, the finger may point at contacts from church, or soda fountain, or playground, et cetera.

The parent-teacher groups have come to expect school surveys because they have been more heavily exposed to propaganda of this nature than other groups; and a mother expects, if her child has a positive Mantoux test, he should have an x-ray of his chest as the next logical step. Usually the positive Mantoux school child is x-rayed then, at some expense to the family or Christmas seal fund or county. The public health nurse spends too much of her time rounding up school children for x-rays, reporting the findings, and explaining what a positive Mantoux means to worried mothers.

Under the age of fourteen or fifteen practically none of these school children with positive Mantoux (that is, a primary tuberculosis) is likely to be sick. He may be a little under par, but he is not sick enough to be hospitalized and not benefited by hospitalization. This has been proved by years of work in so-called preventoriums which have been practically discontinued in the past decade.

After the age of fifteen the children react differently to tuberculosis. Most of them remain well, but a small percentage of those who previously had a positive Mantoux will develop clinical tuberculosis. They may do this anytime in later life.

A relatively large percentage of those who were previously negative Mantoux, when infected with tuberculosis at the age of fifteen to twenty-five, will develop progressive primary tuberculosis or at least a clinical tuberculosis which is quite dangerous. This is the galloping consumption group. These people are sick, consult their physician and are hospitalized promptly; but all too often nothing can be done for them. In this group the tuberculin test is often negative.

What do we get out of a tuberculin school survey? We get a tremendous file of charts showing negative tuberculins on a multitude of children. We get a relatively few positive Mantoux cases. X-rays are taken on perhaps 90 per cent of these and show primary tuberculosis in various stages of healing. Nothing is done, and nothing need be done about it in younger children. Over the age of fifteen, x-rays may show a few with progressive tuberculosis. These can be hospitalized with benefit and treated. In all too many surveys the subject is dropped here.

We get with careful follow-up chest x-rays of the school personnel, teachers, janitors, bus drivers (these ought to have x-rays every year anyway), and some kind of examination of a few family contacts. A few families are very cooperative. They worry about their progeny having tuberculosis. They will have and pay for chest roentgenograms and drag in Aunt Minnie for one. But Grandpa refuses to come in, or too often the father just never gets around to it; and if he waits more than a week or two, gets to talking it over with the boys and wondering what he would do if he actually had "it," he likely never will submit to examination. Some families just will not coöperate at all. This is the weakness of a school survey. The emphasis is greatest in the least fruitful group, the young children. Compulsion is least on the most fruitful group, the parents and old folks in the home. The mother worries and loses sleep, but the father just will not be ordered around by "school authorities." After all he graduated from school a long time ago.

There is no censure on those who refuse to be examined. In from one-third to one-half of the positive Mantoux children the source of infection cannot be located. A recent book has been written on this major weakness in the practice of what in theory looked like a good idea. To search for the source of infection of this group would involve just the sort of program that we now advocate, adult surveys.

Whom do we miss in a school survey? We miss the old folks; 5 per cent of people over sixty have active tuberculosis. They live alone or with grown-up families or in institutions. They have "bronchitis" or "colds" or cough from "too much smoking." They don't expect to feel well. But their tuberculosis does not make them very sick.

We miss the worker, father of a family, always too busy, always at work when the nurse calls, always working when the x-ray department is open, feels well, why should he have an x-ray?

We miss the worker, young, married, male or

female. He is not touched by a school survey, but is found, of course, when the baby dies of tuberculous meningitis—too late.

We miss the worker, single, living out or at home, never thinking of tuberculosis.

Remember that the school survey is designed to find positive sputum cases, nearly all of them moderately or far advanced. The number of minimal cases found by this method is very small, since the minimal cases do not often have positive sputum.

Tuberculosis is still the greatest cause of death in the working years, twenty-five to forty-five: tuberculosis 88, heart disease 70, pneumonia 52, suicide 29, cancer, 28, kidney disease 25, accidents 24. Tuberculosis is of little moment in school children. Why cannot we work on the problem directly instead of indirectly through school children?

We are getting away from this sort of program. Great preventoriums were set up nearly twenty years ago and early in the last decade abandoned as ineffective; children do not as a rule become seriously ill with tuberculosis in grade school years. In preschool years they are extremely susceptible to tuberculosis, but they succumb rapidly (with miliary or meningeal types) or get well after a while with the usual home care of a child of that age. So instead of making the rounds like a watchman every year in the schools, we want to prevent exposure of the children by finding the tuberculosis in the adults.

Our problem is to get as many people examined for tuberculosis as possible. The ideal is to have everyone have a chest x-ray every year; this would pick up early cancer of the lung, cardiac abnormalities, and a number of other nontuberculous conditions early also. But available funds and facilities are not adequate for this ideal. So we must concentrate our efforts on the more fruitful groups of society. School children are not one of these. Under the newer technique, the Mantoux test may be applied also to groups surveyed, but it should not be used as a screen except perhaps in preschool children. The Mantoux should better be applied where some chest condition is found by x-ray screening methods as a matter of establishing the diagnosis. So we are advocating group surveys as more effective than school surveys, and x-ray surveys as more suitable than tuberculin surveys.

We cannot go into the highways and byways and drag in people for examination. It is necessary to propagandize them. We must sell people that it is to their immediate advantage to have examinations. Selling an entire community might perhaps be easier than selling a group, but we cannot survey the entire population now. So we divide the people into approachable units.

In the group method of case-finding we go first to the group with the highest incidence, then work down to groups with lower incidence of tuberculosis. This is a direct approach to potentially diseased persons, not to their children. It is a cheaper method of case-finding than tuberculin school surveys. School children should be the last group on the list and need not be entirely neglected if sufficient funds are available.

Antituberculosis propaganda can be delivered effectively to the groups by speakers or pamphlets directly instead of through interest aroused in the doings of children. The forces that unite a group are nearly always willing to co-operate in an effort that will better the group.

From the standpoint of tuberculosis case-finding the groups of high incidence are:

1. The group of highest incidence is ex-patients from the sanatorium. This group is followed closely in any event, but a few get away from the habit and should be checked up.

2. The next highest incidence group is contacts of known cases. This group has been followed very religiously in some places, entirely neglected in others. This is the chief work of the tuberculosis public health nurse. Such a nursing service is indispensable in control of tuberculosis.

3. Hospital employes. Sanatorium employes have a relatively low incidence because they are careful and have regular checkups, but ordinary hospital employes, handling unrecognized tuberculous patients, are heavily exposed. They should have chest x-ray examinations every six months after the Mantoux becomes positive (and it becomes positive soon in nearly every hospital employe). They should have yearly x-ray examinations anyway.

4. All hospital admissions—every patient admitted to a hospital—should have a chest x-ray examination (unless already taken within six months). About one active case of pulmonary tuberculosis can be found in three hundred or less routine admission films. As a public service

health unit the hospital should be eager to do this at small profit. With he prospect of having to consider tuberculosis in hospital employes as a compensable disease, as it is in state institutions according to a recent Minnesota law and has been in many states previously, they should be doubly anxious to guard against exposure.

5. Sick people—all patients who consult a private physician because of illness or pregnancy—are very good prospects for tuberculosis. The x-ray of the chest is an expected part of every physical examination and should be just as much routine as bone x-rays in fracture cases. It is to the advantage of the patient, the hospital, and the physician that all three become x-ray-conscious. It is a matter of protection for all, like having one's tires checked before a trip to Florida. About one-half the patients in the sanatorium had been observed by private physicians for months or years and treated for everything from cerebral accident to rectal fistula before finding tuberculosis. As they come to realize the importance of early diagnosis, they become more volubly bitter about the physician who missed the diagnosis.

6. Institutionalized people—inmates and employes of asylums, mental hospitals, jails, old folks homes and similar institutions—are thrown together in crowded, unhygienic circumstances, and one case of tuberculosis leads to another. A survey through the state institutions in 1938 showed 81 cases of reinfection tuberculosis of 4,172 inmates tested. Dr. Hilleboe, now with United States Public Health Service, did this work. State law now requires chest x-rays of all new employes in state institutions.

But we shall not discover early tuberculosis among sick people alone. We must examine apparently well people to bring up the percentage discovered early, as against those found too late. Because it cost over a billion dollars to care for the tuberculous veterans of the first world war, the government undertook to take chest x-rays of all inductees for the present armed forces. About one per cent are rejected because of pulmonary tuberculosis. This is the greatest mass survey of all time.

Private industry, whether having war contracts or not, and not just to bring down the excess profits tax, has not been slow to take up the project. Many labor unions have made it a requirement of membership to have a chest x-ray and be free of active tuberculosis. And on the side of management, the progressive companies are taking chest x-rays on all employes.

Progressive school boards are requiring that teachers and other school personnel be free of active tuberculosis. The state law requires that no teacher, pupil, or employe about a school building, who is afflicted with tuberculosis, shall remain about such building without a certificate stating that he or she is not dangerous to others.

Since as yet it is not possible to x-ray all students and since all schools in Wabasha and Winona Counties have come to expect the Mantoux test, in the last few years the test has been performed on the high school seniors and also on the sophomores, the positives being x-rayed. We x-ray the college freshmen and, in fact, all the college students (many of whom are newcomers in our community) who have a positive Mantoux. I think it would be a good idea to x-ray all college freshmen and seniors, so that we would have a record of their heart size and any abnormality that may be present, and have a film to check later films against. But anyway we do a Mantoux test on all college students yearly; this is good in an educational way, as they begin to ask what this testing is all about and are more likely to follow through in later years. We can gradually change to the x-ray method in the next few years. But more important is that we realize that schools are not the best place to find tuberculosis.

We should x-ray all teachers and all school employes in grade schools, high schools and colleges. I think this is a good school program for the present. It leaves the nurse time for more effective work.

All food handlers should be required by law to be free from communicable tuberculosis, as well as syphilis and the typhoid-enteric organisms. It is an outrage for a person to be passed as free of tuberculosis after merely tapping his chest and listening a bit with the stethoscope. Usually only a far advanced tuberculosis is discovered with the stethoscope. We should carry on with surveys of the above groups and industrial groups as well. We shall have to work out some system to survey young women's groups. The childbearing women should be x-rayed as part of their examination in the prenatal period. Women in

industry, whether in shop or office, should have x-ray examinations.

This brings us to the next problem, the cost of the x-rays. In the old days when the x-ray was a makeshift, experimental thing, sort of an eighth wonder of the world, and every machine was a hand-built instrument, and the taking of films was a major adventure with high spoilage and many retakes, when the technique was experimental and the technician guessed at the required exposure time and gauged the voltage by the buzzing of the machine, perhaps then artistic fees were justified for an x-ray examination. But now it is a standard laboratory procedure. Now the technique is standard and any laboratory technician with little practice can take a good chest film. Cost of materials is not exorbitant. Tube cost is reduced to $.05 each exposure, and wear on the rest of the equipment about the same.

This brings us again to the newer x-ray methods—microfilm. Within the last few years, in an attempt to reduce x-ray costs and thus make chest x-ray films more available, experiments were undertaken in photographing the fluoroscopic image. Special fluoroscopic screens with a longer lag than usual and of color particularly suitable for photography were used. A very large and expensive fast lens was needed; this cost a great deal, perhaps $1,000. Ordinary plate holders were used, and because x-ray men were doing the work, they used x-ray film. X-ray film has an emulsion on both sides and is usually used, of course, with two intensifying screens. But after a year or so it was realized that the problem was no longer one of x-raying but simple photography; and thereafter a single emulsion film was used with one hundred per cent better results. The film size is 4 by 5 inches or 35 millimeter movie film or an intermediate size. The 4 by 5 film is read directly; the smaller ones must be projected or read with lenses. All are satisfactory for the ordinary chest. Extra large or thick chests may require the usual 14 by 17 film.

A very small percentage of pulmonary infiltration is missed by these methods, but occasionally a lesion will show more clearly on the microfilm than on the standard film. And again it is the very minimal case that is missed in contrast to the far advanced case that is sometimes missed in a tuberculin survey because of a negative Mantoux. Whenever a suspicious shadow is seen in the small films, a full-size chest film is taken.

These films can be taken at a cost of 25 cents when the technician's time is used to good advantage. The cost of a survey becomes relatively very little. The patient's name, age, address, and date of examination can be printed on the film. The report need be made only in cases showing some pathological condition. Only one visit of the patient is required. No needles are brought into play. No "poison" is injected into the bodies of our children. No return visit in the specified forty-eight hours is necessary, when all too often the person tested cannot be found. The uncoöperative group member is regarded with suspicion by fellow members so the percentage of response is remarkably high, often ninety-eight per cent.

As such a method has been so successful in group surveys, the time will soon come when the general population will be surveyed. Probably you have noticed the propaganda regarding Ely in St. Louis County, where the entire population of the town will be x-rayed. This is the start of an ambitious program to survey the entire county. A survey of the Mexican-descent citizens around San Antonio by small film methods has been very successful. In Cleveland, Ohio, an extensive industrial survey is being launched with the coöperation of labor groups.

Any population group with 1 per cent active tuberculosis is worth, on an economic basis (of cost per case found, reduction in sanatorium stay, work days lost, etc.), a full 14 by 17 chest x-ray survey. A population group of 1 per cent active tuberculosis (and this is the army rejection rate through the country) is surely worth a small film survey. This is a coming thing. It will require a great deal of education of the people, a great deal of support from those who understand illness, a great deal of discussion. The more the merrier; and with this thought planted, I hope we have much discussion. But meanwhile, get chest x-rays on all the sick people you can and all the food handlers you examine. Consider pleurisy as tuberculosis until proven otherwise, and don't trust a stethoscope to discover tuberculosis.

POSTMORTEM EXAMINATIONS

H. E. ROBERTSON, M.D.

Rochester, Minnesota

IN SPITE of the fact that, since about the middle of the sixteenth century and throughout most of the intervening 400 years, a postmortem examination has been deemed desirable and often necessary to determine the cause of death, and in spite of the fact that, in medicolegal disputes in which criminal liability or financial returns are at stake, an examination of the deceased is usually regarded as imperative, there are many among us who strenuously object to this procedure and will not allow it to be performed on relatives or friends. Worse yet, in spite of numerous dissertations on, and demonstrations of, the scientific value of examinations after death, an antagonistic state of mind is often found among physicians, the very persons whose training and a large portion of whose special knowledge has been obtained from the same postmortem examinations to which they themselves are occasionally so firmly opposed.

The frequent refusal to allow, or, worse yet, the more frequent indifference toward, a "postmortem," displayed by this supposedly intelligent group of our professional confreres inevitably reflects itself in the minds of the laity and leads to the conclusion that something is fundamentally wrong either in the medical students' education or in the methods by which the examinations usually are conducted. Somewhat of both defects undoubtedly play a part. In the medical school, "posts" are under the auspices of a professional group whose main object is to expose, as expeditiously as possible, the principal lesions of the body. Morbid curiosity impels the student to stifle his natural emotions of repugnance at the spectacle for which he was more or less well prepared by his previous experiences in the anatomic dissecting room. "Poor Yorick," the deceased, has become for the medical student and the full-fledged physician, a thing apart from his own narrow world and in no way related to his own father or brother or later, perhaps, even his own patient.

"I hope you will not insult me by requesting permission to examine my father," was the astonishing remark of a young medical man to the attending physician. "One thing I wish understood, there will be no autopsy," a physician bellowed when interviewed after the death of his brother, who was also a physician. Both of these objectors would, no doubt, readily acknowledge the debt they personally owed to such examinations, but unquestionably the memory of those few examinations which they had attended, or in which they had taken part, made them unwilling to submit their own kin to such seemingly callous procedures.

And herein lies the first of two greatly needed reforms. Beginning with the "subjects" in the dissecting room, teachers and demonstrators of anatomy can and should emphasize that, after all, the body which is before them was once a human being "even as you and I" and but by the grace of Providence, that same body might represent a member of one of their own families or even one of themselves. By custom, religion and justifiable sentiment that body deserves all the *respect* that can reasonably be accorded to it. Loud talking and dissecting room jokes and antics should be taboo, the dieners might well observe more care in handling the remains and continually the privileges which such dissection afford, should be emphasized in a subdued atmosphere of quiet, dignified surroundings. Not one of the principals in a dissecting room, to say nothing of the students or attendants, would walk into a funeral director's establishment where empty coffins were on display without taking off his hat, laying aside his cigar or cigarette and lowering his voice. There is no dead body of a human being in the whole world which is not entitled to as much deference as a row of empty coffins.

If medical students are trained to observe callousness and indifference toward other people's dead in the dissecting room, what can be offered that is radically different when the students attend postmortem examinations in the old morgue of the city or county hospital. There is no necessity to describe the scene. Every physician in the world has witnessed it and in every place in the world where such examinations are per-

From the Section on Pathologic Anatomy, Mayo Clinic, Rochester, Minnesota.

formed the procedure does not vary materially either in method or in mental attitude toward the deceased. A studied indifference is apparently deemed necessary in order that the scientific or legal purposes of the examination may be expedited. The thought that some little time out for the deference to the dead would be fitting does not seem to have entered the minds of the examining physicians. Their agreement and universal disregard in this matter is an astonishing result of what a fairly unified custom of teaching and practice can promulgate. The need for a sweeping revision of both attitude and methods hardly needs any further affirmative argument.

The second suggested reform has to do with both education and practice concerning the inherent purposes of a postmortem examination. One may well doubt as to whether the broader implications of this phase of medical investigation have been sufficiently well stressed either in the medical school or in the physicians' contacts with pathologists in later life. One well-known physician was heard to remark: "There is no need for a postmortem examination in this case. We already know exactly why he died." Another, a famous surgeon, was said to have stated that he did not want any pathologist telling him why he had lost a patient because he knew all that was necessary before the patient died. There can be little question but that the education of these physicians and of many more like them was faulty in regard to the fundamental purpose of study of bodies after death. For this fault, pathologists themselves must assume a large portion of responsibility. Many of them remind one of that famous Florentine teacher, Benevenius, whose book, "On the Hidden Causes of Disease," was published in 1507, about five years after his death. He gave one of the earliest descriptions of gallstones in the human body and closed the account of his observation by this remark: "We procured the opening of the body and there were found small stones . . . which had collected in the membrane of the liver. . . . As we believed these to have been the cause of death we judged it *vain and useless* to dispute on obscure matters." The italics are mine and emphasize how little change has occurred in the minds of physicians during the short course of some 450 years.

It needs only a little thought to perceive that the stress in considering postmortem examinations should be placed on the importance of determining not only what produced the patient's death but, that which is frequently of far greater importance, what happened to that patient during his lifetime. The perfect study of each individual who has died would include the examination of his previous history as well as the appearance of his external and internal organs and tissues, and theoretically this study should make it possible to reconstruct the sequence, cause and development of each lesion that is discovered. Practically, many gaps in our knowledge are still present and our reconstructions are often very far from perfect. But every examination after death should aid in unraveling some obscure problems and should throw some revealing light on puzzling clinical phenomena. Hereditary tendencies, both good and bad, may be revealed. Incipient stages of many conditions may be studied and clearer notions of their pathogenesis obtained. The following may become known: The effects of the earlier diseases of childhood and of the relative influences of immunity to tuberculosis or other diseases; the importance of various lesions in the different organs for the explanation of physiologic disturbances; the possible usefulness of earlier and different methods of diagnosis and therapy and, just incidentally, the things the attending physician or surgeon might have done or might have omitted that temporarily would have changed the course of events. I say "incidentally" because as our aforementioned famous surgeon implied, those things are probably already known and there is little need or purpose in rubbing it in. If each postmortem examination was made to yield the utmost information, then it might make the pathologists, the attending physicians and the medical students even of future generations better, wiser and more capable men because of it. It would not be an exaggeration to conclude that prolongation of human life, easement of suffering and efficiency of medical care would be, and are, materially benefited by carefully performed postmortem studies.

But in this highly commendable and almost necessary procedure for the successful teaching of medical students and the promulgation of medical knowledge, let the pathologist and all the associated students and professional and nonprofessional attendants not forget for one mo-

ment to uphold the innate right of the human body, be it of a derelict or of a person of great and noble birth, to the utmost respect and consideration. Thereby will be added a dignity to the performance which has been lacking heretofore, and more readily can the broader values of the postmortem examination be emphasized alike to the student and his older colleagues. They may then recognize that such an examination is an unexampled privilege of the entire medical profession, which may and should be honored in its observance not alone on their city hospital "teaching" patients, but on private patients and even their own relatives.

ISOLATION FROM MILK SUPPLIES OF SPECIFIC TYPES OF GREEN-PRODUCING (ALPHA) STREPTOCOCCI AND THEIR THERMAL DEATH POINT IN MILK

EDWARD C. ROSENOW, M.D.

Rochester, Minnesota

(Continued from June issue.)

Virulence of the Streptococci

The results obtained after the intracerebral inoculation of rabbits with streptococci isolated from raw and pasteurized milk in relation to epidemics of poliomyelitis, encephalitis, influenza and hiccup, and remote from epidemics, are summarized in Table V. It will be seen that the respective streptococci were highly specific.

From a study of streptococci as isolated from pasteurized milk by the serial dilution method, it was found that streptococci which grew at extremely high dilutions were usually specifically virulent. The following experiments will suffice to illustrate this point.

Young dextrose-brain broth cultures of fourteen strains of streptococci isolated in pure culture at dilutions ranging from 10^{-8} to 10^{-28} from pasteurized milk supplies during a major epidemic of poliomyelitis were inoculated intracerebrally into rabbits to determine specific virulence. Among twenty-one rabbits so inoculated, flaccid paralysis developed as the outstanding symptom in twelve, seven of which died. Moreover, when freshly isolated cultures of the streptococci were nebulized into the air of cages containing mice and added to the running water in which fish were kept, or when the streptococci were added to the drinking water of young mice, there occurred localization of the streptococci in the central nervous system, symptoms of en-

TABLE V. MORTALITY RATE, SYMPTOMS AND LESIONS AFTER INTRACEREBRAL INOCULATION OF RABBITS WITH STREPTOCOCCI ISOLATED FROM MILK SUPPLIES IN RELATION TO EPIDEMIC DISEASES

Milk supplies from which streptococci were isolated in relation to:	Strains	Rabbits			Symptoms (per cent)					Lesions of respiratory tract (per cent)*	
		Injected	Died		Spasms		Paralysis	Ataxia	Tremors	Trachea	Lungs
			No.	Per cent	Diaphragm	Other muscles					
Poliomyelitis	106	189	114	60	1.0	4.7	**44**	8.9	18	5.2	12
Encephalitis	30	37	25	68	2.7	**41**	8.1	**38**	**62**	44	56
Influenza	60	76	30	39	1.3	7.9	6.5	3.9	14	**50**	**93**
Hiccup	18	50	24	41	**54**	**75**	6.7	3.2	**44**	17	25
Control: remote from epidemics	38	51	16	31	2.0	2.0	5.9	2.0	5	13	19

*Of animals that died.

cephalitis and formation of encephalitis virus,[20] and death from encephalitis and flaccid paralysis,[18,26] respectively, in significant incidence.

The results obtained in mice after intraperitoneal, intracerebral and intranasal inoculation of streptococci freshly isolated in dextrose-brain broth from raw and pasteurized milk are summarized in Table VI.

The mortality rate, invasion of the blood stream and the greater tendency of the streptococci isolated from milk during epidemic periods to localize electively in comparison to that of strains isolated from milk supplies remote from epidemics is strikingly shown.

TABLE VI. VIRULENCE FOR MICE OF STREPTOCOCCI ISOLATED FROM MILK SUPPLIES IN RELATION TO EPIDEMIC DISEASE

Milk supplies from which streptococci were isolated in relation to:	Mortality rate and isolations of streptococci								
	Mice			Isolations of streptococci from:					
		Died		Blood		Brain		Pleural fluid	
	Injected*	No.	%	Animals	%	Animals	%	Animals	%
Epidemics of encephalitis, poliomyelitis and hiccup	396	209	53	73	41	92	**51**	17	18
Epidemic influenza	470	311	66	265	34	230	22	141	**45**
Nonepidemic diseases	188	81	43	55	23	19	5	20	25
Total	1,054	601	57	393	34	341	29	178	40

*Intraperitoneally, intracerebrally or intranasally.

TABLE VII. CATAPHORETIC TIME OF STREPTOCOCCI FROM MILK AND OTHER DAIRY PRODUCTS IN RELATION TO EPIDEMIC COLDS, INFLUENZA, POLIOMYELITIS AND ENCEPHALITIS AND INTEREPIDEMIC PERIODS

	Source of streptococci	Strains or Cases	Cultures	Streptococci timed	Percentages of streptococci distributed in cataphoretic time intervals of half seconds						
					1.7 to 2.1	2.2 to 2.6	2.7 to 3.1	3.2 to 3.6	3.7 to 4.1	4.2 to 4.6	4.7 to 5.1
Raw and pasteurized milk	Remote from colds	34	35	558	7	21	**37**	17	14	2	2
	During epidemic colds	30	41	803	5	**22**	**24**	**29**	13	4	2
	Remote from influenza	22	31	601	9	16	**51**	10	11	1	2
	During epidemic influenza	62	65	751	3	9	11	17	**19**	**18**	**23**
	Remote from epidemic poliomyelitis	54	62	878	2	19	**33**	26	16	3	2
	During epidemic poliomyelitis — After animal passage	51	51	798	**11**	9	5	9	**49**	13	5
	During epidemic poliomyelitis — As isolated	71	101	1,804	**12**	13	10	14	**35**	12	3
Dairy products	Remote from encephalitis	54	54	1,044	9	23	**45**	13	8	1	1
	During epidemic encephalitis St. Louis (1933)	139	139	2,483	**30**	14	23	11	11	2	10

Specificity of Streptococci as Shown by Cataphoresis

It has been shown elsewhere that alpha streptococci having virulence and other properties characteristic of streptococci associated with epidemic diseases occur commonly in milk and other dairy products, as well as in air, in water and in emulsions made of flies and mosquitoes at the time of epidemics.[9,10,13] I have applied the cataphoretic method of study to strains of streptococci isolated from milk supplies.[9,12,16] The distribution of cataphoretic time of streptococci isolated from raw and pasteurized milk and other dairy products during and remote from epidemics of colds, influenza, poliomyelitis and encephalitis is summarized in Table VII. The mode of the streptococci isolated from milk at the time of the respective epidemics was very different, and was characteristic of the streptococci isolated from patients suffering from the respective epidemic disease.[13,27] In contrast, the mode of the streptococci isolated from milk remote from epidemics resembled that of streptococci isolated from the nasopharynges of well persons and persons who had diseases not caused by streptococci remote from epidemics, and of epidemic strains after prolonged cultivation on artificial mediums.

TABLE VIII. AGGLUTINATION OF STREPTOCOCCI ISOLATED FROM MILK

Milk from which streptococci were isolated in relation to:	Strains	Percentage incidence of specific agglutination* by antiserums prepared with streptococci from			
		Polio-myelitis	Encepha-litis	Ar-thritis	In-fluenza
Poliomyelitis	152	**84**	7.2	2.6	1.3
Encephalitis	112	13	**71**	—	0.88
Influenza	70	4.3	13	11	**69**
Hiccup	20	—	**80**	—	20
Control: remote from epidemics	49	14	18	18	16

*No specific agglutination by normal horse serum. Agglutination was considered specific if greater in the different dilutions of a given antiserum, or if it occurred in at least tenfold greater dilution of the specific antiserum, than of control antiserum.

TABLE IX. COMPARATIVE VALUE OF DIFFERENT CULTURE MEDIUMS IN DETERMINING THE THERMAL DEATH POINT OF STREPTOCOCCI SUSPENDED IN AUTOCLAVED MILK

Test mediums	Suspensions of streptococci in milk heated at					
	63°C., 30 minutes		68°C., 30 minutes		73°C., 30 minutes	
	Cultures	Per cent yielding streptococci	Cultures	Per cent yielding streptococci	Cultures	Per cent yielding streptococci
Dextrose-brain broth	674	**38**	250	14	477	0
Dextrose broth	206	13	110	4.5	81	0
Blood-agar	539	13	33	7.2	366	0
Autoclaved milk	210	24	38	0	131	0

Serologic Specificity of Streptococci

By the special methods used successfully in previous studies,[17] a large number of agglutination experiments was carried out with the streptococci isolated from milk and other dairy products using convalescent human serum and the serum of horses hyperimmunized with streptococci obtained from persons who were ill with the respective diseases. The results obtained with the hyperimmune serums, according to epidemics, are summarized in Table VIII. A high degree of specificity was found for each of the groups of epidemic strains studied, which was not the case for strains isolated from milk remote from these epidemics. The specific agglutinin content of the serum of persons for the respective strains was found to be increased during convalescence.

Resistance to Heat of Epidemic and Non-epidemic Strains of Alpha Streptococci

Streptococci from various sources, on isolation and after prolonged cultivation on artificial mediums, were suspended in autoclaved milk and heated at 63, 68 and 73° C. (145.4, 154.4 and 163.4° F.) for thirty minutes to test resistance of the various strains to heat. Cultures were then made routinely in dextrose-brain broth, and frequently also in dextrose broth, in autoclaved milk and on blood-agar plates. The importance of the use of a highly favorable medium, such as dextrose-brain broth, to determine whether the streptococci resisted heating at the different temperatures, is shown in Table IX. After heating at 63°C. (145.4° F.) (pasteurizing temperature), the incidence of isolation of streptococci in dextrose-brain broth was uniformly higher (38 per cent) than in autoclaved milk (24 per cent), dextrose broth (13 per cent) and blood-agar (13 per cent). Heating at 68° C. (154.4° F.) for thirty minutes, and at 73° C. (163.4° F.) for ten or twenty minutes did not suffice to kill all streptococci in milk, whereas heating at 73°C. (163.4° F.) for thirty minutes invariably did suffice. On the basis of these results, dextrose-brain broth was used routinely for making cultures from milk supplies as obtained at the time of study, after pasteurization of raw milk and after repasteurization, under controlled condition in the laboratory, of commercially pasteurized milk, and for testing the heat-resistance of streptococci suspended in milk.

The total incidence of isolations of streptococci in dextrose-brain broth after pasteurization or heating (63° C. [145.4° F.] and 73° C. [163.4° F.] for thirty minutes under controlled conditions) of suspensions of streptococci in milk is summarized in Table X. The incidence of isolation of streptococci after pasteurization at the usual temperature was highest (86 per cent) in the case of epidemic strains that had resisted previous commercial or laboratory pasteurization and was next highest in the case of epidemic strains obtained from milk supplies (45 per cent), and from persons having epidemic encephalitis (39 per cent). The incidence of isolation after pasteurization in milk of streptococci obtained from persons having poliomyelitis (31 per cent) or influenza (21 per cent), from indoor and outdoor air (33 per cent) and from water (32 per cent) in relation to poliomyelitis, encephalitis and influenza, also was significantly higher than after pasteurization of streptococci obtained from well persons (13 per cent) or persons ill

TABLE X. RESISTANCE TO HEAT OF ALPHA STREPTOCOCCI ON ISOLATION AND AFTER PROLONGED CULTIVATION IN RELATION TO EPIDEMIC AND NONEPIDEMIC DISEASES

Source of streptococci		Suspensions of streptococci in milk heated at 63°C., 30 minutes			Suspensions of streptococci in milk heated at 73°C., 30 minutes		
		Strains	Cultures	Per cent yielding streptococci*	Strains	Cultures	Per cent yielding streptococci*
Persons ill with	Poliomyelitis	137	192	31	89	130	0
	Encephalitis	117	171	39	106	144	0
	Influenza	29	39	21	20	27	0
	Nonepidemic disease	39	52	10	15	18	0
Well persons remote from epidemics		62	75	13	36	37	0
Milk in relation to poliomyelitis, encephalitis and influenza		202	242	45	202	242	0
Water, sewage and mosquitoes in relation to poliomyelitis		41	59	32	39	55	0
Indoor and outdoor air in relation to poliomyelitis, encephalitis and influenza		76	112	33	23	44	0
Epidemic strains that had resisted heating to 63°C. for 30 minutes on isolation		21	21	86	21	21	0
Epidemic strains after prolonged cultivation on artificial mediums		49	63	0.16	49	63	0
Totals	Freshly isolated strains from epidemic diseases	623	836	38	500	663	0
	Freshly isolated strains from nonepidemic sources, and epidemic strains after prolonged cultivation	150	190	8	100	118	0

*In dextrose-brain broth cultures.

with chronic disease (10 per cent) remote from epidemics and than after pasteurization of epidemic strains after prolonged cultivation on artificial mediums (0.16 per cent). Thirty-eight per cent of 836 cultures of streptococci representing 623 epidemic strains, and 8 per cent of 190 cultures representing 150 nonepidemic strains, resisted pasteurization at 63° C. (145.4° F.) for thirty minutes. Pasteurization at 73° C. (163.4° F.) for thirty minutes sufficed to kill the streptococci in every instance, regardless of their source or time after isolation.

To check further the technical procedures used in these studies, autoclaved milk was inoculated with mixtures of young cultures of Bacillus subtilis, Escherichia coli, hemolytic or beta type of streptococci and staphylococci, and then pasteurized under controlled conditions at 63° C. (145.4° F.) for thirty minutes. Escherichia coli, beta type of streptococci and staphylococci were killed in every instance and Bacillus subtilis was killed in most instances.

TABLE XI. INCIDENCE OF ISOLATION OF ALPHA STREPTOCOCCI FROM STOOLS AFTER HEATING AT 63°C. FOR THIRTY MINUTES

Source of stools		Specimens cultured	Incidence of isolation of alpha streptococci after heating suspensions of stools at 63°C. for thirty minutes: Specimens yielding streptococci	
			Number	Per cent
Persons ill with	Acute poliomyelitis	72	36	50
	Acute encephalitis	27	12	44
Persons convalescent from poliomyelitis		32	7	22
Well persons remote from epidemics		61	2	3

To compare the resistance to heat of streptococci that had grown in vivo with that of the freshly isolated alpha streptococci associated with epidemic and other diseases and those from well persons remote from epidemics, 10 per cent emulsions in saline solution of stools of patients who had poliomyelitis or encephalitis and emulsions of stools of well persons remote from epidemics were diluted threefold in saline solution and heated at 63° C. (145.4° F.) for thirty minutes in the laboratory under controlled conditions. Sterility tests were made in dextrose-brain broth. The scope and results of these experiments are shown in Table XI. Alpha streptococci, nearly always in mixture with gram-positive bacilli (Clostridium perfringens) and only occasionally with Echerichia coli, were isolated far more often from pasteurized suspensions of stool specimens that had been obtained from persons ill with poliomyelitis (50 per cent) or encephalitis (44 per cent) than from persons convalescent from poliomyelitis (22 per cent) and than from well persons remote from epidemics (3 per cent).

Epidemiologic Significance of Streptococci Isolated from Milk

Evidence was not lacking that milk supplies from which specific types of alpha streptococci were isolated were responsible for epidemic outbreaks and sporadic cases. One institutional out-

break of acute poliomyelitis at a college was traced to milk.[10] Spread of the disease stopped abruptly when the use of the milk in which large numbers of the poliomyelitic type of streptococcus were demonstrated was discontinued.

A rural outbreak of poliomyelitis[27] was traced to improperly refrigerated raw milk that was supplied by several dairies, in the herds of which the streptococcus was demonstrated in milk obtained directly from cows. In a major outbreak of poliomyelitis,[28] streptococci having "poliomyelitic" cataphoretic velocity and which produced flaccid paralysis in rabbits were isolated from a brand of pasteurized milk supplied to families in which the incidence of poliomyelitis was far greater than in families in which other brands of pasteurized milk were used and from which this type of streptococcus was not obtained. In still another epidemic of poliomyelitis[14] in which several brands of milk were used, milk obtained where cases had occurred revealed the streptococcus whereas no cases could be traced to the milk from which the streptococcus could not be isolated and which, through the foresight of the dairyman, was pasteurized at 155° F. instead of at the usual 145° F. In many instances composite milk supplies and milk obtained in a sterile manner directly from cows (which usually showed no evidence of disease of udders) supplying the milk for isolated family groups where one or more cases of poliomyelitis, encephalitis,[22] influenza or persistent hiccup had occurred were shown to contain the respective specific types of streptococci. In one institutional outbreak of influenza the alpha type of streptococcic flora obtained from the nasopharynges of patients and similar flora contained in suspensions of a brand of cheese which the patients had consumed were indistinguishable. The epidemic disappeared promptly after the cheese was eliminated from the diet.

During institutional and community outbreaks of influenza, the number of colonies of streptococci that grew in soft dextrose-brain agar and on blood-agar and the pneumotropic virulence of the streptococci, as demonstrated by inoculation of animals with streptococci isolated in dextrose-brain broth from raw and pasteurized milk, were uniformly much higher than in the case of the same milk supplies three months after the epidemic had disappeared.

An institutional outbreak of acute appendicitis was traced to ice cream and an outbreak of epidemic parotitis (mumps) was traced to butter and cheese from which alpha streptococci that produced appendicitis in rabbits and parotitis in dogs were isolated.[23] The ice cream was a local product, but the butter and cheese had been manufactured far remote from the outbreak studied, at a time when epidemic parotitis was prevalent. An epidemic of sore throat associated with a high incidence of myositis was traced to a streptococcus in the milk supply.[24] The streptococcus, on isolation from throats of patients and from the milk, produced myositis in rabbits following intravenous injection.

Milk supplies, even pasteurized supplies, sometimes appeared to be responsible for the persistence of mild symptoms after attacks of epidemic disease, and for mild nonepidemic conditions in which the milk supplies were not considered as a possible source of infection. In several cases of perforating gastric ulcer and of gastric hemorrhage due to ulcer, the milk used was found to contain large numbers of the ulcer-producing type of streptococcus. Slight fever among patients convalescing from epidemic poliomyelitis and encephalitis and symptoms, such as persistent cough and recurring sore throat, after attacks of colds and influenza often disappeared when the respective milk supplies from which the streptococci were isolated were boiled or were eliminated.

Discussion and Summary

Results of these studies on alpha streptococci in relation to milk supplies are in accord with results of other workers, but through the use of brain-containing mediums they have been carried a step further, in that the incidence of isolation of streptococci has been higher and in that specificity of streptococci characteristic of those associated with certain epidemic and nonepidemic diseases has been demonstrated. The brain-containing mediums, especially in serial dilution cultures, were essential for the isolation of the virulent, epidemic strains without loss of specificity. The isolation of alpha streptococci from milk after pasteurization has been reported by Ayers and Johnson,[2,3] Stark and Stark,[33] Park,[6] Bickwith and Eddie cited by Sears and Benson,[29] Kitchen,[4] Seibel[30] and others. In the original experiments which led to pasteurization of milk as now practiced, only a few tests were

performed on the resistance to heat of the alpa type of streptococci.[5,6,7] These organisms isolated by methods then available were found more resistant to heat than hemolytic streptococci, but were considered as of little or no epidemiologic importance.[7]

The streptococci isolated by our methods from milk supplies during epidemics of encephalitis, poliomyelitis, influenza and hiccup manifested respective specific virulence or disease-producing properties and had characteristic distribution curves of cataphoretic velocity. They were agglutinated specifically by the respective antistreptococcic serums and they often grew in milk at usual refrigerator temperatures and in far higher serial dilutions in dextrose-brain broth and dextrose-brain agar than streptococci from milk supplies remote from epidemics, resembling, in these respects, the streptococci isolated from the respective patients and viruses.[16] Streptococci present in milk during epidemics and those isolated from patients were unusually resistant to heat on isolation, often remaining viable, as shown by the use of dextrose-brain broth, after being subjected to commercial pasteurization and pasteurization under controlled conditions in the laboratory at 63° C. (145.4° F.) for thirty minutes. The specific properties, including high resistance to heat, disappeared abruptly on cultivation on the usual mediums and more slowly on cultivation in the brain-containing mediums. The relation of the streptococci isolated in these studies to Streptococcus durans or Streptococcus zymogenes isolated from pasteurized milk by Sherman and Wing[31] was not determined.

Clinical and experimental evidence obtained indicates (1) that raw, and less often pasteurized, milk supplies shown to contain alpha streptococci true to type are probable sources of infection; (2) that during epidemics the streptococci normally present in respiratory and intestinal tracts of persons and broadly present in nature, including milk, acquire virulence and other properties characteristic of the streptococci associated with the respective epidemics; (3) that the incidence of diseases resulting from acquired specific virulence of the streptococci is increased by the drinking of milk containing the specifically virulent organisms.[10]

The experimental production from neurotropic or pneumotropic alpha streptococci of filtrable infectious agents resembling the viruses[9,15,20,21] of encephalitis, poliomyelitis and influenza,[25] respectively, and the demonstration of small, short-chain forming diplococci in filtrates of poliomyelitis[19] and encephalitis[11] virus and in filtrates of experimental infectious agents produced from streptococci,[19] indicate that epidemic types of streptococci in milk may be a source of the respective viruses. Regardless of whether specifically virulent alpha streptococci, which our methods have shown to be present consistently in raw and pasteurized milk supplies during epidemics, play a primary or secondary role in causation and spread of diseases now attributed to virus, the presence of viable streptococci in milk, even of those not at the moment virulent, should be regarded as an active or potential hazard to health and hence should be eliminated.

Pasteurization of milk by the holding and flash methods, as now practiced, while apparently adequate to kill beta streptococci, nonvirulent alpha streptococci and other pathogenic organisms commonly present in raw milk, has been found inadequate to kill specifically virulent alpha streptococci commonly present in milk supplies during epidemics of encephalitis, poliomyelitis, respiratory infections, influenza and hiccup. More efficient methods than are now generally used for the detection and killing of these organisms in milk are clearly indicated. To accomplish this ideal, slight, easily applicable modifications of methods now in general use fortunately have been found.

From the data obtained it is suggested (1) that in addition to the standard methods now in general use for the bacteriologic examination of milk and other dairy products without due regard to type or virulence of the organisms milk contains, dextrose-brain broth and dextrose-brain agar be used because highly favorable for the isolation of specifically virulent streptococci; (2) that growth of streptococci from raw and pasteurized milk supplies in high dilutions in these mediums be considered presumptive evidence of virulence of the organisms, and (3) that milk be pasteurized routinely at 73° C. (163.4° F.) for thirty minutes, or at least that it be pasteurized at this temperature during epidemics when, as has been shown, specifically virulent streptococci are present which resist the present-day holding and flash methods of pasteurization. I am informed that pasteurization equipment now in general use could be adapted to this higher

temperature merely by adjustment of the temperature regulator. After pasteurization of bulk milk at this higher temperature the cream-line usually is not obliterated and the slight alteration of taste which occurs should not be considered objectionable, but rather as evidence that the milk was adequately heated to kill specifically virulent as well as saprophytic alpha streptococci.

References

1. American Public Health Association: Standard methods for the examination of dairy products; bacteriological, bioassay and chemical. Ed. 7. New York: American Public Health Association, 1939.
2. Ayers, S. H., and Johnson, W. T., Jr.: Ability of streptococci to survive pasteurization. J. Agric. Research, 2:321-330, 1914.
3. Ayers, S. H., and Johnson, W. T., Jr.: Studies on pasteurization. XI. The "majority" and "absolute" thermal death-points of bacteria in relation to pasteurization. XII. Cause and significance of pin-point colonies from pasteurized milk. J. Bact., 9:279-300, (May) 1924.
4. Kitchen, J. M. W.: Milk bacteria which proliferate before, and those which survive pasteurization: new methods applied to meet an as yet unremoved menace. M. Rec., 92: 409-414, (Sept. 8) 1917.
5. North, C. E., Park, W. H., Moore, V. A., Rosenau, M. J., Armstrong, Charles, Wadsworth, A. B., and Phelps, E. B.: Commercial pasteurization. U. S. Pub. Health Bull., No. 147, (Feb.) 1925.
6. Park, W. H.: Thermal death point of streptococci. Am. J. Pub. Health, 18:710-714, (June) 1928.
7. Rosenau, M. J.: The thermal death points of pathogenic microörganisms in milk. U. S. Hygienic Laboratory Bull., No. 42, (Jan.) 1908.
8. Rosenow, E. C.: Elective localization of bacteria in the animal body. In Jordan, E. O., and Falk, I. S.: The newer knowledge of bacteriology and immunology. Chap. 43, pp. 576-589. Chicago: University of Chicago Press, 1928.
9. Rosenow, E. C.: The relation of streptococci to the filtrable virus of epizoötic encephalitis of the fox. J. Infect. Dis., 48:304-334 (Mar.) 1931.
10. Rosenow, E. C.: An institutional outbreak of poliomyelitis apparently due to a streptococcus in milk. J. Infect. Dis., 50:377-425, (May-June) 1932.
11. Rosenow, E. C.: Observations with the Rife microscope of filter-passing forms of microörganisms. Science, 76: 192-193, (Aug. 26) 1932.
12. Rosenow, E. C.: The relation of streptococci to the epidemic of encephalitis in St. Louis: preliminary report. Proc. Staff Meet., Mayo Clin., 8:559-563, (Sept. 13) 1933.
13. Rosenow, E. C.: Cataphoretic velocity and virulence of streptocci isolated from throats of human beings, from raw milk, flies, water, sewage and air during epidemics of the common autumnal cold. Am. J. Hyg., 19:1-21, (Jan.) 1934.
14. Rosenow, E. C.: Observations on the epidemic of acute anterior poliomyelitis in Havana, 1934. Proc. Staff Meet., Mayo Clin., 9:613-616, (Oct. 10) 1934.
15. Rosenow, E. C.: The relation of streptococci to the viruses of poliomyelitis and encephalitis: preliminary report. Proc. Staff Meet., Mayo Clin. 10:410-414, (June 26) 1935.
16. Rosenow, E. C.: Isolation of bacteria from virus and phage by a serial dilution method. Arch. Path., 26:70-76, (July) 1938.
17. Rosenow, E. C.: Recurring encephalomeningoradiculitis with fibromyositis following poliomyelitis: a bacteriologic study of sixty-four cases. Arch. Int. Med., 64:1197-1221, (Dec.) 1939.
18. Rosenow, E. C.: Epidemic poliomyelitis, recurrent encephalomeningoradiculitis and fibromyositis in relation to streptococci obtained from a water supply. Arch. Int. Med., 67:531-545, (Mar.) 1941.
19. Rosenow, E. C.: Microdiplococci in filtrates of natural and experimental poliomyelitis virus compared under the electron and light microscopes. Proc. Staff Meet., Mayo Clin., 17:99-106, (Feb. 18) 1942.
20. Rosenow, E. C.: The relation of neurotropic streptococci to encephalitis and encephalitis virus. Proc. Staff Meet., Mayo Clin., 17:551-560, (Nov. 4) 1942.
21. Rosenow, E. C.: Studies on the relation of a neurotropic streptococcus and virus to epizoötic encephalitis of wild ducks. Cornell Vet., 33:277-304, (July) 1943.
22. Rosenow, E. C., and Caldwell, H. W.: Studies on the etiology and serum treatment of encephalitis during the epidemic in North Dakota and Minnesota (1941). Proc. Staff Meet., Mayo Clin., 16:587-588, (Sept. 10) 1941; Ann. Int. Med., 17:474-485, (Sept.) 1942.
23. Rosenow, E. C., and Dunlap, Stella L.: An epidemic of appendicitis and parotitis probably due to streptococci contained in dairy products. J. Infect. Dis., 18:383-390, (Apr.) 1916.
24. Rosenow, E. C., and Monn, V. H.: On an epidemic of sore throat and the virulence of streptococci isolated from the milk. J. Infect. Dis., 17:699-671, (July) 1915.
25. Rosenow, E. C., and Williams, H. L.: Unpublished data.
26. Rosenow, E. C., Heilman, F. R., and Pettet, C. H.: Observations on the epidemic of polio-encephalitis in Los Angeles, 1934. Proc. Staff Meet., Mayo Clin., 9:443-451, (July 25) 1934.
27. Rosenow, E. C., Rozendaal, H. M., and Thorsness, E. T.: Acute poliomyelitis; studies of streptococci isolated from throats and raw milk in relation to one epidemic. J. Pediat., 2:568-593, (May) 1933.
28. Rosenow, E. C., South, Lillian, H., and McCormack, A. T.: Bacteriologic and serologic studies in the epidemic of poliomyelitis in Kentucky, 1935. Kentucky M. J., 35: 437-446, (Sept.) 1937.
29. Sears, H. J., and Benson, R. L.: Pathogenic streptococci and milk pasteurization. Am. J. Pub. Health, 13:937-940, (Nov.) 1923.
30. Seibel, E. E.: Hitzfeste Bakterien in der bei 63° C. ½ Stunde Dauer pasteurisierten Milch. pp. 41-79. Berlin: J. Springer, 1926.
31. Sherman, J. M., and Wing, Helen U.: Streptococcus durans or Streptococcus Zymogenes isolated from pasteurized milk. J. Dairy Sc., 20:3-15, 1937.
32. Soper, H. W.: Milk. Arch. Pediat., 60:1-9, (Jan.) 1943.
33. Stark, C. N., and Stark, Pauline: The relative thermal death rates of young and mature bacterial cells. J. Bact., 18:333-337, (Nov.) 1929.

MUCH SICKNESS CAUSED BY FAILURE TO GROW UP

Achieving grown-up, mature feelings and attitudes is a difficult job, but an important one from the standpoint of both health and happiness. Many of the people who crowd the doctors' offices are sick, with real aches and pains and disorders of digestion or other functions, because they have not acquired emotional maturity. The goals which describe this kind of maturity are given by Dr. Maurice Levine, of the University of Cincinnati, in a recent book for doctors, *Psychotherapy in Medical Practice*. Here they are:

1. Ability to be guided by reality rather than by fears.
2. Use of long-term values.
3. Grown-up conscience.
4. Independence.
5. Capacity to "love" someone else, but with an enlightened self-interest.
6. A reasonable dependence.
7. A reasonable aggressiveness.
8. Healthy defense mechanisms.
9. Good sexual adjustment with acceptance of own gender.
10. Good work-adjustment.

If you are confused about how a person can be both independent and reasonably dependent, the explanation is that one should not be a "clinging vine" woman or the type of man who expects to be babied by his wife, but should be able to stand on one's own feet and make decisions, yet able to take useful advice and to both give and receive love and affection. It is just as babyish to be always giving as to be always demanding.

For an example of being guided by reality, Dr. Levine gives the case of a mother whose child in reality interrupts too frequently. The mother who thinks the child's behavior is cute is immature, but so is the mother who sees such behavior as the first step in a criminal career. The grown-up mother neither praises the child nor punishes him severely for the interruption, but tries to understand why he interrupted and to help him understand why he should wait his turn to speak.—*Science News Letter*, June 26, 1943.

MINNESOTA MATERNAL MORTALITY STUDY

General Summary

By the Maternal Mortality Committee of the Committee on Maternal Health of the Minnesota State Medical Association

(Continued from June issue.)

The Committee for the Minnesota Maternity Mortality Study laid down the following as one stipulation for minimum requirements for adequate prenatal care: pelvimetry, to include mensuration of the anteroposterior diameter of the inlet (internal), mensuration of the intertuberous diameter and palpation of the sacrum (internal). These have long been considered minimum requirements for pelvimetry but how far the medical profession has strayed from its medical school teaching is shown in Table XIV. Of ninety-four patients (84 per cent) who were registered, i.e., had been given prenatal care, seventy-seven, or 82 per cent, had no pelvic mensuration or less than required by the minimum standard clause. When asked for the pelvic measurements, most of the physicians who cared for these patients declared that they "didn't consider mensuration necessary since the patient was a multipara," they "never took measurements unless these seemed indicated," they "didn't believe in pelvic measurements," or that the "record was lost," "misplaced," or "locked in a safe that could not be opened until the next day" or some specified time after the investigator would have departed. These responses came even in regard to patients in whom there was good evidence from past obstetrical history that there probably was pelvic pathology. No tabulation was made of the cases in which no medical record was kept by the physician or a grossly inadequate history taken, but these instances were legion and discovered during interview of the physician. In not a few instances the investigator obtained much more information about the case from hospital records or attendants than at the appointment with the physician. Without a doubt the great majority of physicians' office records were of little value as regards accurate information on pertinent data, if indeed there were any records. Moreover, the same can be said of hospital records in a great many instances.

The following minimum requirements for adequate obstetrical care were adopted by the Committee for the Minnesota Maternal Mortality Study:

TABLE XIV. TYPE OF PELVIS

		No. of Cases	Per Cent of Cases
Not measured		95	84.9
Registered	77		
Unregistered	18		
Measured		17	15.2
Normal	9		
Generally contracted funnel	2		
Funnel typical	4		
Generally contracted rachitic	1		
Generally contracted typical	1		
Totals		112	100.1

Minimum Requirements for Adequate Obstetrical Care

(Adopted by the Minnesota Maternal Mortality Committee)

First prenatal visit

1. Adequate history and general physical examination with accurate follow-up of any abnormality revealed by these.
2. Pelvimetry to include anteroposterior of inlet (internal), palpation of sacrum, and intertuberous diameter.
3. Blood Wassermann.

Routine prenatal visits

1. Blood pressure determination.
2. Urinalysis, especially for albuminuria.
3. Weight determination.
4. Abdominal palpation during last two months of gestation.
5. Reasonably adequate study of abnormalities presenting themselves during these visits.

Labor and delivery

1. Adequate use of generally recognized obstetric procedures.
2. Observance of adequate asepsis.

Postpartum care

1. Reasonable promptness in the recognition of abnormalities.
2. Reasonable promptness in the institution of adequate treatment.

Postmortem examination

1. Completeness in itself or as an adjunct to clinical observation.

Death certificate

1. Accuracy in assignment of cause of death.
2. Completeness of data requested.

Birth certificate

1. Completeness in reporting desired data.
2. Accuracy of data.

Death certificate of child

1. Accuracy in assignment of cause of death.
2. Completeness of requested data.

Using these as a basis for evaluation, Tables XV, XVI, and XVII are summaries of the care given the patients in this series prenatally, in labor and delivery, and in the postpartum period. Whenever faulty care was obviously responsible, in whole or in part, for the maternal death, it was also classified as con-

TABLE XV. PRENATAL CARE GIVEN PATIENT

	No. of Cases	Per Cent of Cases	
None	8*	7.1	
Adequate	2	1.8	
Faulty but non-contributory	47	42.0	91.1%
Faulty and contributory	55	49.1	
Totals	112	100.0	

*This figure does not coincide with the number of unregistered patients since in the remaining ten cases, the absence of prenatal care was considered a contributory factor in the causation of death; in almost all of the latter it was patient responsibility.

TABLE XVI. CARE GIVEN PATIENTS IN LABOR AND FOR DELIVERY

	No. of Cases	Per Cent of Cases	
None	22	19.6	
Adequate	7	6.3	
Faulty but non-contributory	22	19.6	74.1%
Faulty and contributory	61	54.5	
Totals	112	100.0	

TABLE XVII. POSTPARTUM CARE GIVEN PATIENTS

	No. of Cases	Per Cent of Cases	
None	28*	25.0	
Adequate	4	3.6	
Faulty but non-contributory	13	11.6	71.4%
Faulty and contributory	67	59.8	
Totals	112	100.0	

*All died undelivered (23) or immediately following delivery except two patients with postpartum hemorrhage who lived two and three hours respectively after delivery but had no active postpartum care in spite of the fact that both were attended at delivery by physicians.

TABLE XVIII. TIME OF OBTAINING BLOOD WASSERMANN IN CURRENT PREGNANCY

Time taken	No. of Cases	Per Cent of Cases	
Not taken in current pregnancy	70	62.5	73.2%
Not taken at first prenatal visit	12*	10.7	
Taken at first visit			
Negative	29	25.9	
Positive	1	0.9	
Totals	112	100.0	

*All were negative and were obtained after the first prenatal visit or after later hospitalization, some after delivery.

TABLE XIX. COMPLETENESS AND CORRECTNESS OF MATERNAL DEATH CERTIFICATE

Quality	No. of Cases	Per Cent of Cases
Complete and correct	19	17.0
Complete but incorrect	25	22.3
Incomplete, otherwise correct	22	19.6
Incomplete and incorrect	40	35.7
Complete but false	5	4.5
Complete, correctness not determinable	1	0.9
Totals	112	100.0

tributory. The startling revelations in these tables are that adequate care was given in only 1.8 per cent of the cases in the prenatal period, 6.3 per cent in labor and for delivery, and 3.6 per cent in the postpartum period, while care was faulty from 71 to 91 per cent in the various phases.

One phase of prenatal care, besides pelvic mensuration, which merits special consideration is the routine taking of the blood Wassermann. This, like pelvic mensuration, has long been considered an absolute essential to adequate prenatal care. There can never be the excuse that there is no available laboratory facility for obtaining this test in the State of Minnesota since the State Board of Health operates an adequate laboratory and performs these tests without charge. In spite of these facts, 73.2 per cent of the patients did not have venapuncture done for the Wassermann test at the first prenatal visit; and, what is worse, 62.5 per cent had no Wassermann test in association with the pregnancy, as is seen in Table XVIII. The one patient with a known positive blood Wassermann reaction succumbed to encephalitis from arsenic therapy. Whether this was due to the more than usual frequency of administration of the arsenical or a true sensitivity of the patient to the drug may be debated.

Completeness and correctness of maternal death and of birth certificates are summarized in Tables XIX and XX. Examination of photostatic copies of these certificates in connection with the completed maternal mortality study made it fully apparent that physicians and coroners signing these certificates gave very little time or thought to correctness or completeness. Indeed, in five instances, 4.5 per cent, the death certificates were actually falsified as to the cause of death.

Several of these have already been mentioned in other connections. An unmarried woman is presumed to have died of veronal poisoning whereas the physician after collaborating on an inadequate postmortem examination declared death due to diabetes. He did this in order to "save the relatives." One patient was delivered by a consultant employing elective cesarean section at thirty-seven weeks gestation, but thereafter what care there was came primarily from the original general practitioner. Death on the eighth day was

TABLE XX. COMPLETENESS AND CORRECTNESS OF BIRTH AND STILLBIRTH CERTIFICATES

	No. of Cases	Per Cent of Cases
Complete and correct	9	8.0
Complete and incorrect	3	2.7
Incomplete, otherwise correct	37	33.0
Incomplete and incorrect	24	21.4
Not reported, required by law	5†	4.5
Not reported, not required	34‡	30.4
Early abortion 13		
Died undelivered 21*		
Totals	112	100.0

†Does not include three known instances in which birth or stillbirth certificates were not filed until the physician was asked by the Minnesota Bureau of Vital Statistics to do so. The absence of these was discovered in matching maternal death certificates for companion birth certificates.
‡The Minnesota law is interpreted as requiring a birth certificate if the pregnancy has advanced to at least twenty weeks whether live-birth or stillbirth.
*Does not include the two cases delivered by postmortem cesarean section.

TABLE XXI. PRIMARY OR IMMEDIATE CAUSES OF DEATH

Causes of Death		No. of Cases	Per Cent of Cases
Toxemia		7	6.25
Eclampsia	4		
Antepartum	1		
Intra-and postpartum	1		
Postpartum	2		
Arteriolosclerosis	3		
Cardiovasular renal disease	1		
Cerebral hemorrhage	2		
Infection		30	26.79
Pul. embolism from thrombophlebitis	9		
Peritonitis after cesarean section	2		
Peritonitis—bowel obstruction after C.S.	1		
Septicemia from puerperal infection	5		
Septic abortion	7		
Septicemia from cellulitis of chin	1		
Peritonitis from appendectomy	3		
Peritonitis from visceral perforation	1		
Sepsis of undetermined origin	1		
Shock and hemorrhage		30	26.79
Birth traumas	1		
Retroperitoneal hematoma (spontaneous)	1		
Postpartum hemorrhage	9		
Postoperative shock	2		
Intra-abdominal hemorrhage (ectopic)	3		
Premature separation of placenta	3		
Inversion of uterus	1		
Shock from transfusion reaction	1		
Ruptured uterus (traumatic)	2		
Shock from op. del. on severe cardiac	2		
Hemorrhage from placenta previa	4		
Unexplained (mid-forceps del., 54 hr. labor)	1		
Other obstetrical complications		23	20.54
Adrenal hemorrhage (fulminating pre-eclampsia)	1		
Anesthetic death	3		
Suicide (eclampsia with psychosis)	1		
Cerebral hemorrhage (?rupture of aneurysm)	1		
Pneumonia	6		
Transfusion reaction	2		
Cardiac failure	5		
Alkalosis	1		
Hypoglycemic shock	3		
Non-obstetrical complications		19	16.96
Subacute bacterial endocarditis	2		
Automobile accident	1		
Acute anterior poliomyelitis	3		
Suicide and/or homicide	2		
Meningitis (otitis media)	1		
Brain tumor	1		
Carcinomatosis (melanoma of scalp)	1		
Bowel obstruction (ca. of trans. colon)	1		
Encephalitis (arsenic therapy)	1		
Actinomycetic meningitis	1		
Pulmonary tuberculosis	3		
Peritonitis (mesenteric thrombosis)	1		
Peritonitis (small bowel obstruction)	1		
Not determinable		3	2.67
(?) Late vomiting of pregnancy with pyelitis	1		
(?) air embolism (vaginal insufflation)	1		
Sudden (advanced pulmonary tuberculosis)	1		
Totals		112	100.00

clearly due to postoperative peritonitis but the original physician would not request permission for autopsy and declared death due to pulmonary embolism, since "what the relatives did not know would not hurt them." A patient was delivered of her second child at home and died one and one-fourth hours later as a result of postpartum hemorrhage but the physician claimed death due to "pulmonary embolus." Another patient dying of postpartum hemorrhage three hours after spontaneous delivery at forty-two weeks' gestation was declared to have died of "pulmonary embolus." Finally, the physician who packed a vagina because of profuse antepartum vaginal bleeding, left without intentions of further therapy, and allowed the patient to bleed to death without transfusion or other specific therapy after four hours of hospitalization, refused to sign the death certificate because he "felt no responsibility for the patient since she had previously been delivered by another physician." The coroner signed the certificate, was correct in assignment of cause of death, but falsified when he declared that "she was rushed to the hospital." Actually four hours intervened between the physician's visit and hospitalization.

All vital statistics reports are based upon information obtained from these certificates which are signed by attending physicians or by duly authorized representatives of the law. Such reports can be no more accurate or reliable than the data upon which they are based. The high percentage of incompleteness and incorrectness together with the real error produced by falsification in these data make the reports far from their desired accuracy and reliability. All certificates signed by coroners are so inferior that it is doubted whether it is wise to continue to allow these laymen to file such certificates. If all remaining signers, the physicians, were "statistics-minded," the results would reach a high degree of accuracy.

The primary or immediate causes of death are listed in Table XXI. The causes of death enumerated here are those determined by the Committee from the completed studies and are independent of the causes listed on the death certificates. The distribution of the causes of death coincides fairly well with that shown by Peckham for the Counties of Maryland[3] and for the United States Registration Area as well as that

TABLE XXII. PREVENTABILITY OF AND RESPONSIBILITY FOR DEATH

	No. of Cases	Per Cent of Cases
Preventable	82	73.21
Physician responsibility 68		
Patient responsibility 4		
Physician and patient responsibility 7		
Physician and disease responsibility 3		
Nonpreventable	27	24.11
Not determinable	3	2.67
Totals	112	99.99

TABLE XXIII. ECONOMIC STATUS OF PATIENT AND RESPONSIBILITY OF DEATH

Economic Status of Patient	Preventability of Death	No. of Cases	Per Cent of Cases
Charity		27	24.11
	Nonpreventable 10		
	Preventable 16		
	Preventability not determined 1		
Per Diem		2	1.79
	Nonpreventable 1		
	Preventable 1		
Private		83	74.11
	Nonpreventable 16		
	Preventable 65		
	Not determined 2		
Totals		112	100.01

given by Yerushalmy[4] except for the toxemia group. It will be recalled that all these latter statistics are obtained from death certificates and questionnaires, whereas the causes of death in this study were determined by a group of specialists after reviewing exhaustive studies reported by a staff of well-trained obstetricians.

One of the most common errors found on the death certificates was in the toxemia group. The general trend was to assign toxemia as the primary cause of death wherever it was present even though toxemia was not the immediate cause of death. A typical example of this is found in the patient who clearly died of adrenal insufficiency from extensive hemorrhage into both glands and not from the fulminating preeclampsia which may well have been responsible for these hemorrhages. No tabulation has been made of the total number of such errors, but it is quite likely that if we placed all deaths in which there was hypertension into the toxemia group, the incidence of toxemia deaths would probably reach proportions similar to those generally reported.

Preventability of death with fixation of responsibility for death is tabulated in Table XXII. The three cases listed as "not determinable" are the same ones in which it was not possible because of incomplete data from physicians, or inadequate postmortem examination, et cetera, to determine with any degree of certainty the primary or immediate cause of death. Moreover, in each of these the patient study was so incomplete that it would not have been unjust to have assigned at least partial physician responsibility in all three. However, excluding these uncertain cases, the Committee agreed that eighty-two deaths, or 73 per cent, were preventable and that in all but four instances the physician was wholly or partially responsible for the unfortunate outcome to the patient. We have few figures to compare with those of this table, since, for fairly obvious reasons, they are rarely published. A report from New York City for 1933 mentioned by Peckham[3] indicated that 65.8 per cent of 2,041 maternal deaths were strictly preventable and Peckham drew similar conclusions from material in rural Maryland. These percentages compare favorably with our own. However, Peckham's opinion (no statistics given) was that there was frequent patient responsibility for failure to seek prenatal care. Such instances in our series were very rare. The New York City report fixed patient responsibility in one-third of the preventable maternal deaths.

Economic status of patient is listed with preventability of death in Table XXIII. This is an attempt to determine the relative quality of medical care given patients in different economic levels. Since there are no standard criteria for evaluating the economic status of a family, the determination for this table was made on the basis of the physicians' statements or from the type of hospital admission rather than from a rooms: persons ratio. Physicians in private practice, with no charity or teaching service, sometimes contend that care of private patients differs from that given charity patients, especially on a teaching service, inferring that the former receive better care than the charity patients. Taking only the definitely assigned preventable and nonpreventable deaths in these two groups, it is seen that care given the charity and the private patient in the study did differ but that charity patients received the better care—more than two and one-half times as many deaths were determined to be preventable in the private patients than in the charity group. It should be added that the charity group of this study is not packed with teaching material but that 70 per cent of the free patients were handled in strictly nonteaching institutions.

Length of life of the mother after delivery is recorded in Table XXIV. The first twenty-four hours after delivery took the greatest toll of deaths, 31.25 per cent of the total. Excluding the twenty-three cases (20.54 per cent) which died undelivered, the average length of time elapsing between delivery and maternal death was seventeen days. The census bureau will probably eliminate the following individuals who died more than three months after delivery; small bowel obstruction 133 days after elective cesarean section for preëclampsia; actinomycotic meningitis ninety-eight days after spontaneous premature delivery; pulmonary tuberculosis ninety-two days after spontaneous term delivery; pulmonary tuberculosis and tuberculous enterocolitis 173 days after spontaneous delivery at thirty-eight weeks' gestation; and peritonitis due to bladder and bowel perforations at exploratory lap-

TABLE XXIV. DISTRIBUTION OF DEATHS OF MOTHERS BY INTERVAL BETWEEN BIRTH OF FETUS AND MATERNAL DEATH

Life After Delivery	No. of Cases	Per Cent of Cases	Per Cent Omitting Died Undelivered
Died undelivered*	23	20.54	
Died in first hour after delivery	8	7.14	8.99
Died in first day after delivery	27	24.11	30.34
Died in first week after delivery	22	19.64	24.72
Died in first month after delivery	16	14.29	17.98
Died more than one month after delivery	11	9.82	12.36
Died more than three months after delivery	5	4.46	5.62
Totals	112	100.00	100.01

*Includes two cases delivered by postmortem cesarean section.

arotomy 112 days after the onset of a septic abortion. Omitting these only for purposes of comparison with other statistical studies, we find the average period of mothers' survival after delivery to be 10.77 days which is greater than Yerushalmy's figure[4] by 1.67 days. Of those mothers succumbing within the first twenty-four hours after delivery, the average period of survival was found to be 7.27 hours with eight patients or 7 per cent of the total surviving the delivery by less than one hour. Obviously, the survival time is dependent upon the cause of death. Accordingly, all but two of thirty deaths due to shock and hemorrhage occurred in the first day after delivery (twenty-four) or died undelivered (four), while only two of the thirty in the infection group succumbed before delivery or within the first twenty-four hours after delivery.

Much more discussion should be given to the deaths due to infection and to shock and hemorrhage, for these two groups make up 53.3 per cent of all the maternal deaths in this series. There are outstanding examples of failure to recognize shock or to institute prompt therapy for it. There are also many examples of failure to replace blood loss with whole blood transfusions or even with serum or plasma infusions, too much confidence being placed in saline or glucose infusions which can never be expected to aid except for very brief or temporary periods of time. It should not be necessary to call attention to this latter fact, for hardly a medical journal today fails to have at least one article on shock or hemorrhage.

Another surprising revelation in this study is the generally inadequate therapy for puerperal infection, even in the hands of the specialist. The dosage of the sulfonamide given is usually grossly inadequate. This could be easily discovered if blood levels of the drug were obtained, but this essential to adequate chemotherapy was practically always ignored. There can be no doubt that improvement in the therapy for puerperal infection and in recognition and prompt treatment of shock and hemorrhage would materially decrease the maternal mortality rate in Minnesota.

Twenty-three patients, 20.5 per cent, died before delivery. This incidence is six times as high as reported by Yerushalmy[4] (3.5 per cent) and more than twice as high as recorded by Peckham[3] (9.09 per cent). It is significant that two-thirds of these deaths in our series were considered preventable with physician responsibility alone or in combination with the patient or the disease in all but one case. These include the following causes of death: antepartum eclampsia, intra-abdominal hemorrhage from ectopic pregnancy (two cases), cerebral hemorrhage with arteriolosclerosis, brain tumor, premature separation of the normally implanted placenta and transfusion reaction from Rh factor, peritonitis following appendectomy with an undiagnosed tubal pregnancy, hypoglycemic shock, transfusion reaction in a cardiac of at least class II, antepartum hemorrhage from placenta previa, cardiac failure (two cases), and pneumonia. The cause of death was not determinable in two cases. Among the nonpreventable deaths were two cases of acute anterior poliomyelitis. Two-thirds of the patients who died undelivered were private patients but only one-half of these were considered preventable deaths.

Legal residence for the purpose of this study was considered *urban* when the population was at least 10,000 inhabitants, since in each such city in Minnesota there is at least one well-equipped hospital where ideal obstetric practice is possible. Two patients were residents of Wisconsin and all others were residents of Minnesota. One of the former was cared for by a physician whose legal residence is Wisconsin, but he cared for the patient in a hospital in Minnesota. The legal residence of thirty-five (31.25 per cent) of the mothers was urban and of the remaining seventy-seven it was rural. During the period covered by the study 34 per cent of the births in Minnesota were to women legally resident in urban centers. Actually, however, 48 per cent of the births occurred in cities of 10,000 or more. When thirty-five deaths of urban women are related to the total number of live births to urban residents, it is found that the maternal death rate is 1.9 per thousand live births. Similarly, seventy-seven deaths of women with rural residences give a death rate of 2.1 per thousand live births. It appears, then, that place of residence does not materially affect the obstetric results. Yerushalmy,[4] in New York State exclusive of New York City, found the same puerperal fatality rates as well as stillbirth and neonatal mortality rates in residents of urban localities and rural districts.

Summary

1. From July 1, 1941, through June 30, 1942, a study was made of the maternal mortality in the State of Minnesota.

2. Due to the omission of mention of pregnancy within three months of the maternal death, the Minnesota maternal mortality rate each year is being underestimated by approximately 0.13 points.

3. There is a tendency for the maternal death rate to be above the average in the late winter and early spring and to be below this level in the fall and early winter.

4. It might be significant that 40 per cent of the mothers losing their lives in association with pregnancy and childbirth were more than 34 years old.

5. Delivery occurred in a hospital in 61 per cent of the 112 instances.

6. The small number of grand multiparae might suggest that Eastman's contention that the rate is greatly increased in the high parity bracket (9 or more) is not verified in this series.

7. With a liberal interpretation, forty-three patients (38.4 per cent) were well when first seen and died later.

8. The absence of any consultation in 56 per cent of the cases, the presence of less than 10 per cent adequate consultation, and the inadequacy of two-thirds of the consultations which were obtained raises certain obvious questions.

9. One-half of the inadequate consultations in our series were supplied by specialists, men who by training and experience should be capable of furnishing superior counsel.

10. Considering all viable fetuses, a stillborn and neonatal death rate of 38.3 per cent was obtained.

11. There was an unfortunately high incidence of operative deliveries (56.2 per cent); some of the deaths resulted directly from the operative procedure.

12. The handling of placenta previa was worse than that accorded to any other complication.

13. Twelve (15 per cent) of the operative procedures were cesarean sections; five being nonelective and done from eight to 120 hours after the onset of labor.

14. Only 8 per cent had autopsies considered adequate.

15. Failure of coroners to perform their duties and to request or demand postmortem examinations on those patients dying under circumstances suggestive of violence is outstanding.

16. Seventy-seven (82 per cent) had no pelvic mensuration or less than the minimum requirements for adequate prenatal care laid down by the Committee for the Minnesota Maternal Study.

17. The great majority of physicians' office records were of very little value as regards accurate information, if indeed there were any records.

18. According to the minimum requirements for adequate obstetrical care as adopted by this committee, adequate care was given in only 1.8 per cent in the prenatal period, 6.3 per cent in labor and for delivery, and 3.6 per cent in the postpartum period.

19. A blood Wassermann has long been considered an absolute essential—yet 73.2 per cent of these cases did not have venapuncture for Wassermann test at the first prenatal visit; and 62.5 per cent had no Wassermann test in association with the pregnancy.

20. It is fully apparent physicians and coroners signing maternal death and birth certificates gave very little thought to correctness or completeness and in five instances the death certificates were actually intentionally falsified as to cause of death.

21. All certificates signed by coroners were notoriously inferior.

22. Tables of the primary or immediate causes of death and the preventability with fixation of responsibility are given.

23. The Committee agreed that eighty-two deaths (73 per cent) were preventable and that in all but four instances the physician was wholly or partially responsible.

24. From this study it would seem that charity patients received the better care.

25. Deaths due to infection and to shock and hemorrhage make up 53.3 per cent of all the maternal deaths in this series.

26. A surprising revelation is the general inadequacy of the therapy used to combat puerperal infection.

27. It appears that place of residence (urban or rural) does not materially affect the obstetric results.

References

1. Eastman, N. J.: The hazards of pregnancy and labor in the "grande multipara." N. Y. State J. Med., 40:1708-1712, 1940.
2. Osborn, S. H.: Connecticut Obstetrical Consulting Service; Pediatric Consulting Service. State Department of Health, Hartford, Conn., M. C. H. 62 (7-41); 4 mimeo. pgs.
3. Peckham, C. H.: A survey of 447 maternal deaths occurring in the counties of Maryland during the years 1930-36 (inclusive). Am. J. Obstet. & Gyn., 36:317-330, 1938.
4. Yerushalmy, J., Kramer, M., and Gardiner, E. M.: Studies in childbirth mortality. I. Puerperal fatality and loss of offspring. Reprint No. 2167, Public Health Reports, 55:1010-1027, 1940.
5. Yerushalmy, J., Kramer, M., and Gardiner, E. M.: Studies in childbirth mortality. III. Puerperal fatality in relation to mother's previous infant losses. Reprint No. 2295, Public Health Reports, 56:1463-1481, (July 18) 1941.
6. Yerushalmy, J., Palmer, C. E., and Kramer, M.: Studies in childbirth mortality. II. Age and parity as factors in puerperal fatality. Reprint No. 2175, Public Health Reports, 55:1195-1220, 1940.

TUBERCULOSIS AND PREGNANCY

When delivering a woman with active pulmonary tuberculosis, the severity of the illness and the extent of the lesion must receive consideration. The internist or phthisiologist must be responsible for the tuberculous condition during confinement just as he has been during pregnancy.

It seems good obstetrics to allow these women to come to term and deliver naturally. However, to induce labor ten to fourteen days early, when the condition of the patient permits, saves time when the load of pregnancy is greatest. The doctor should be liberal with analgesia during the early stages of labor and supportive treatment is necessary. The main points I wish to stress are: relieve pain, conserve energy, save blood and support the patient.—E. P. ALLEN, M.D.

PIONEER PHYSICIANS OF FARIBAULT COUNTY

ROSCOE C. HUNT, M.D.
Fairmont, Minnesota

(Continued from June issue.)

Daniel Straw

Daniel Straw was born in Guilford, Maine, May 17, 1847, where his early life was spent. He entered Kents Hill High School in 1861, attended Dartmouth, and graduated from the Medical School, October 29, 1869. He located at Wells, Minnesota, in 1871, where he practiced twenty years. On October 16, 1872, he married Florence Watson at Somerville, Massachusetts. There were five children: Nellie, who died in infancy; Florence, now Mrs. B. E. Jones, Bismarck, North Dakota; Frederick, Vancouver, Washington; Harry, deceased and Constance, wife of Col. L. M. Oseth, Washington, D. C.

Doctor Straw was a pioneer country doctor of the traditional type. He never refused a call, whether it was out at a shanty on the prairie in the night or in a blizzard, or whether it meant sacrificing a pleasure trip for himself. His patients said that his magnetic personality and cheery greeting were a tonic in the sickroom.

He was very fond of horses and always had a barn full of the best. He rode horseback a great deal, and kept special saddle-bred horses. His greatest enjoyment and diversion were with his horses.

The Episcopalian Church of the Nativity in Wells was built largely through his efforts. It now contains a beautiful altar as a memorial to him, with the simple inscription, "In Memory of Daniel Straw, the Beloved Physician."

He was always interested in civic affairs, was mayor a number of years, and a school board member for many terms. He was a Mason.

His death occurred at his home in Wells, July 19, 1891, from peritonitis. He was forty-four years old.[1,5,6,9]

Francis McGuire

Francis McGuire was born in Pennsylvania, April 11, 1836. His early life was spent in Ashland, Wisconsin. He graduated from Rush College, probably in 1858, certainly previous to the Civil War, as he was a surgeon for three years in the 14th Wisconsin Regiment. After the war, and probably before, he was in practice in Jefferson, Wisconsin. He located in Blue Earth City in 1877.

Like several others, he came to Blue Earth City following the death of Doctor Winch in July, 1877. Franklin, Ackerman and McGuire remained. Several others, including J. W. Andrews, left after a few weeks or months.

The *Blue Earth City Post*, August 18, 1877, shows the following notice:

"We were pleased to meet Doctor F. McGuire, of Jefferson, Wisconsin, this week, who was in town with a view to locate here. The doctor is of mature years, ripe in professional experience, having been 20 years in practice, three years of which he was surgeon of the

14th Wisconsin Regiment. After looking over the situation and advising with many citizens he has decided to cast his lot with us. He returned yesterday to Wisconsin to close up his business and will be here again in a couple of weeks."

The September 22, 1877, issue of the same paper states:

"Doctor F. McGuire, physician and surgeon, from Jefferson, Wisconsin, arrived Wednesday evening and has already hung his shingle and is ready for business. He has had over 20 years experience in his profession, three years of which was army surgeon and comes among us with the best references. We are glad to count him among our prominent residents. His office for the present will be with G. W. Buswell."

The *Blue Earth City Post* published the following, December 21, 1882:

A CARD

"Aside from being unprofitable, my age and health forbid so much riding and fatigue; therefore the following notice:

"After January 1, 1893, I shall not attend patients over 10 miles from town, unless it be in surgery, obstetrics or consultation except at following prices: One dollar for each mile over ten; thus 12 miles $7, 15 miles $10 per visit. All accounts must be fixed up within three months, or as soon thereafter as bill is presented. Hope all who read this will tell their neighbors, that none be disappointed. Subscribe for the *Post* and be Posted."

On October 3, 1884, he moved to Saint Paul with office at 199 East Seventh. In 1887 he moved to St. Cloud. He died there on December 19, 1895. He was buried in the Blue Earth cemetery, although the date of death is not given. Doctor McGuire had an excellent reputation, both as a physician and as a man.[1,7,19,22]

Albert James Franklin

Albert James Franklin was born April 3, 1852, at Leads, Columbia County, Wisconsin. He had common school education and in 1875, after his parents had become residents of Faribault County, he studied medicine with Doctor Winch. Later he attended Keokuk Medical College and graduated in 1876. His parents had come to Minnesota in 1861, locating in Verona Township. Doctor Franklin kept the farm until his death.

Doctor Franklin started practicee in Blue Earth City in the fall of 1877, a few months after the death of his preceptor, Doctor Winch. The *Post* states that Doctor Franklin bought the books and instruments of the late Doctor Winch. About a month after Doctor Winch's death Dr. A. W. Ackerman had located in Blue Earth City, and it is also of record in the same paper that Dr. J. W. Andrews had come to locate, having left Sleepy Eye. No further notice is found about Doctor Andrews; he probably remained a short time before going to Mankato.

Doctor Franklin married Lillie Nichols of Blue Earth City. There were two daughters, Hazel and Hope, and one son, Floyd. The latter has farmed in Faribault County.

Doctor Franklin was a man of great strength and physical endurance. His reputation as an obstetrician was good and he had a large obstetrical practice. He believed in dark, bad-tasting medicine and plenty of it, and was considered a successful physician. He was greatly interested in Masonry and never missed a meeting, especially if the third degree was to be given. He always took the same prominent part. Many an urgent call had to wait until Jubalum had done his final deed, and it certainly was a "knock-out."

The doctor's hobby was farming and he accumulated about his father's old homestead a thousand acres of the best land. He had so much he couldn't get it well

cultivated, but he always said he liked weed patches for the prairie chickens to nest in. He also greatly enjoyed his horses and had the best. He at one time went into racing. One of the horses was a little black mare, Panora Maid. She could pace in 2:10 and gave him enough enjoyment to compensate for the losses he took while in the racing business.

His death came in the early evening of October 9, 1911. He had returned from the farms with his favorite team, and as he was carrying oats to them, he sank down beneath their feet dead.[1,7,14,15,17,18,19]

Augustus William Ackerman

Augustus William Ackerman was born May 24, 1851, at Burnett Junction, Wisconsin. His parents lived on a farm and he attended schools in the community. He attended some medical school in Wisconsin, before going to Hahnemann Medical College and Hospital, Chicago. His diploma received from Hahnemann was dated—"Millesemo Octingentesimo LXXX, Republicæ Vero C IV."

It is of record that Doctor Ackerman started practice in Blue Earth City in 1877. The *Blue Earth City Post*, July 21, 1877, stated that Doctor Ackerman had come from Good Thunder and located in Blue Earth City. He practiced medicine there until 1887. He then discontinued medical practice and started the practice of dentistry. This he continued until shortly before his death. In preparation, he had graduated from the Chicago Dental College.

Doctor Ackerman married Lucy Anderson of one of the pioneer Anderson families who had come from New York State, May 1, 1879. He had four accomplished daughters. Three are still living, Floy, Mrs. Charles H. Freer of Portland; Hazel, Mrs. Bossard of Minneapolis, and Frac, Mrs. Reusswig, of Portland.

While there were blizzards with attendant death and loss of feet and hands in the early days, probably the greatest scourges were the epidemics of what were called black diphtheria. All the doctors told about them; every cemetery tells a silent story of their results. One of the most severe and extensive epidemics was in 1880, in Faribault County There were many deaths. The files of the *Blue Earth City Post* mention this epidemic and state that it was especially bad in Pilot Grove Township. In this connection there are verified stories of the faithfulness of Doctor Ackerman, his staying out on the prairie with the stricken families night after night until the weeks of sickness and death were past. He, like others of these pioneer doctors, was many times lost in blizzards, slept in hay stacks and later walked home after his horses had strayed home.

Doctor Ackerman was one of the finest of men, cultured and proficient. Everyone liked him, and for many years he was one of the leaders in the community. He belonged to the medical and dental societies, the Masons, Maccabees, Woodmen and the Presbyterian Church. His recreation was hunting.

He died at his home in Blue Earth, September 2, 1923.[7,12,14,17]

Mitchell Mikkelson

Mitchell Mikkelsen was born in Dane County, Wisconsin, July 27, 1850. He was the eldest of a family of six whose parents were Knute and Caroline (Erickson) Mikkelsen. He attended the schools of the community until he was fourteen years of age, when the family moved to Faribault County.

His father secured from the Government 160 acres in Section 28, Lura township.

No furrow had been turned in the rich prairie land which was later to become one of the many highly productive farms of Southern Minnesota. Mitchell went through the hardships of the early settler on the land, doing farm work along with his schooling which he got as he could from the schools thereabouts.

In 1872, when a man of twenty-two, he went to South Dakota where he homesteaded 160 acres adjoining an Indian Reservation. He had some unpleasant experiences with the Indians. He was employed by the Indian Agent as herder of the Texas cattle owned by the Agency. While at this job, he saved enough money to take up his medical studies. He first entered the office of Dr. George D. Winch of Blue Earth City, where he read medicine for about two years. He then went to the College of Physicians and Surgeons at Keokuk, Iowa, and after a few months there, graduated in 1877. Later, in 1887, he graduated from the College of Physicians and Surgeons of Chicago. He started practice in Delavan in 1878, but there is no record as to the details of the Chicago medical study. He practiced in Delavan until 1891, and then after the death of Doctor Straw he moved to Wells, where he practiced until shortly before his death in 1918, at the age of sixty-eight.

Doctor Mikkelsen was always a Republican. He was a Mason, a Woodman, and surgeon for the Chicago, Milwaukee, and St. Paul Railway.

October 22, 1879, he married Ella Hefron, who was born in Columbia, Wisconsin. She died at her home in Delavan in 1890. One son, Willie B., was born November 26, 1882. The doctor was again married to Mary Perizo de Runo and there was one child, L. M., born in Wells, April 2, 1894.[1,4,6,19,31]

Archer Clifton Jacobs

Archer Clifton Jacobs was born August 24, 1852, in New York State. His family moved to Blue Earth County, Minnesota, when he was a boy, and he went to country school there. He was first educated for teaching and did teach school for several years but decided to take up medicine at Minnesota College Hospital where he graduated. He located in Elmore in April, 1886, and continuously practiced there for fifty-three years.

Doctor Jacobs came to Elmore soon after the railroad got there, and it was a raw railroad town. Many dwellings were covered with tar paper and consisted of only one room. South and West the land was unbroken prairie. In his early years before any roads had been made, he rode horseback. Early settlers still remember his famous horse Black Betsy. She was a beautiful animal with almost human intelligence, and, like Dr. McClure's Jess, carried him through storm and flood. Later he purchased horses from a breeder in Vernon Center. They were a wonderful strain of rather large horses with great intelligence. Doctor Jacobs was a very small man with a high-pitched voice and presented a rather incongruous appearance with these fine horses hitched to his Lindeman buggy.

As a citizen he was a man of very high principles and practiced them in his social and professional life. He was a prominent member and supporter of the Methodist church where he taught a Sunday School class for over forty years. He was much interested in Masonry and held many offices, but his medical practice always came first.

On October 24, 1885, he married Frances Kinney, who survives.

For some years before his death he avoided night calls except when his associate was on vacation but practiced up to six months before his death on June 28, 1939.[17,20]

(To be continued in the August issue.)

President's Letter

The AMA Council on Medical Services and Public Relations

The meeting of the American Medical Association, held in Chicago, June 12 to 15, was very successful. The attendance was large and the scientific program was of the usual high standard.

Many of the important points made in the report of the new Council on Medical Service and Public Relations were discussed at a meeting held the day before the regular sessions. Representatives of nearly all the states were present. Members from each area were called upon to express their opinions regarding Council activities, as presented by the chairman, Dr. L. H. Bauer, of New York.

The general sentiment was in favor of the work so far carried on. The delegates were particularly interested in what Dr. Joseph Lawrence, formerly in charge of public relations for the New York State Medical Association, had to say about conditions in Washington.

The recommendations of the Council were accepted by the House of Delegates and the Board of Trustees. Dr. Lawrence will continue his work in Washington on a full-time basis, and he will have the assistance of an attorney in accordance with the recommendations. The Council also recommended that more aid be provided to county and state societies interested in establishing prepayment plans for medical service. A new man will be added to the Council staff for that purpose.

The whole report showed clearly that the Council has been very active. Members have given of their time and energy entirely for the good of American medicine.

Inasmuch as Dr. Louis H. Bauer was elected, at this session, to the Board of Trustees of the American Medical Association, Dr. Thomas A. McGoldrick of New York was chosen to take his place on the Council.

It is of great interest to note that the other five members of the Council were re-elected. We are all pleased to have Dr. A. W. Adson of Rochester again representing this section.

It is very gratifying to follow the dignified, constructive course the Council has followed since its creation a year ago, and the doctors of Minnesota can be justly proud to have had a guiding hand in its development.

E. Brandelson Jones

President, Minnesota State Medical Association.

Editorial

CARL B. DRAKE, M.D., *Editor;* GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

NO MEDICAL GRADUATES AFTER FOUR AND A HALF YEARS

IF the recent action of the Selective Service System in not exempting the present premedical students from the draft is continued, what will be the result?

In the first place there will be no interns and residents in four and a half years and thereafter until students are again allowed to enter the premedical course. This will be a catastrophy for the hospitals which are absolutely dependent on recent graduates in medicine if they are to give proper care to patients.

The medical schools will have no students and will be terribly disorganized in their premedical and medical instruction as long as the lack of students continues. With no students, there will be no need of a faculty.

The exemption of premedical students involves about 6,000 young men in each class, and the total manpower involved should not exceed (we hope) two or three times this number.

Although more doctors will have been turned out during these war years than normal, there will be more need for doctors during war and postwar years.

If Selective Service does not wish to have premedical students on the inactive list, reversion can be made to prewar methods with the medical schools making the selection.

Whatever solution is made of this very serious problem, we are strongly convinced that for the good of the future health of the nation, the constant flow of new medical graduates, if necessary in restricted numbers, is essential.

SHORTAGE OF HOSPITAL BEDS

THE shortage of hospital beds in the Twin Cities is most acute. What the situation is in the rest of the state we are not in a position to know. We have reason to believe, however, that the shortage is rather general.

A few years ago many hospitals were "in the red" and had been for a number of years. Some were considering closing their doors, and, of course, some did.

There are a number of reasons for the change in the occupancy of the private hospitals. As a result of higher income in most population groups, people are better able to pay for hospital service. Further, widespread hospital insurance enables many who would otherwise be forced to accept free hospital accommodations to patronize pay hospitals. Doubtless, the institution of part-pay at some of the tax-supported hospitals has led many to prefer private physician and hospital. Possibly more elective surgery is being done at present. Possibly, too, the busy practitioner is more likely to send his patients to a hospital in order to minimize the number of house calls. How much the possession of hospital insurance is abused is hard to say.

The inability to obtain a hospital bed in case of an acute illness requiring hospital care is a serious situation. While the hospitals have been filled in winter months in recent years, there have been vacancies during the summer months. Now, in certain localities at least and probably quite generally, the hospitals are filled even in the ordinarily light summer months.

What solution is there for the congested condition in the private hospitals? Economic conditions after the war will doubtless result in some diminution in the number of citizens able to pay hospital bills, and the tax-supported hospitals, instead of being only partly filled, as at present, will be patronized to a greater extent. New hospital construction is out of the question for the duration. The facilities of the lightly-patronized public hospitals are scarcely suited for conversion to private units, although this may be a possibility in isolated instances.

The only solution of the present acute congestion would seem to be the coöperation on the part of the medical profession in caring for patients, who do not actually require hospital care, in their homes so that the acutely sick may be accommodated. The coöperation of the public is just as essential.

MARRIAGES AND BIRTHS DURING THE WAR

WE have all been conscious of the increase in marriages in recent years, especially in the youthful group. That there has been a marked increase in marriages in all age groups is perhaps not so well appreciated.

An analysis of the figures in New York State,* which probably hold more or less for the entire country, shows that marriages increased in frequency in 1940 over 1939, about 23 per cent in the age group below twenty; 29 per cent in the age group twenty to thirty-four; and 18 per cent in the age group thirty-five and over. These increases in 1940 about doubled in 1941 in all the age groups combined and tripled in the groups under twenty and over thirty-five in 1942.

The decrease in marriages in the age group from twenty to thirty-four in 1942, compared with 1941, is accounted for by the fact that the youths in this group had largely left the state of New York by that year. In 1943, there was a general falling off in the marriage rate which will probably continue this year.

It is interesting to note that England has apparently been similarly affected by the war.† Marriages increased by over 100,000 in 1942 compared with 1938, although they fell some 66,000 in 1943 below the 1938 level. As a result, the live births in 1942 and 1943 continued to show a marked increase over prewar levels. The birth rate in 1943 was the highest in England and Wales in eighteen years. The disappearance of unemployment and war allowances for wife and children are credited with this showing.

Thus has the destruction of the lives of citizens of the United States, England, and Wales been compensated to some degree at least as a result of economic and doubtless emotional factors resulting from the war.

*Wartime Changes in Age at Marriage, Statistical Bulletin, Metropolitan Life Insurance Company, May, 1944.

†Foreign Letters: London. Jour. Am. Med. Assn., 125:507, (June 17) 1944.

AMERICAN BUREAU FOR MEDICAL AID TO CHINA

IN 1937, a group of Chinese doctors and merchants in America established the American Bureau for Medical Aid to China for the purpose of sending medical supplies to China. The organization has since been joined by Americans interested in China and sympathetic to its plight. It operates through agencies of the Chinese Government and the National Red Cross of China in coöperating in the sphere of private and public health and now receives its financial support as an agency of the United China Relief, which in turn is supported by the National War Fund.*

China as a result of six years of invasion has suffered from a dearth of doctors, nurses, and medical supplies for its army and civilian population. This bureau has been interested particularly in furnishing funds and supplies in the form of drugs, vaccines, hospital equipment and the like, for the Chinese Army Medical Administration, the National Health Administration, and the four National Medical Colleges. With 60,000,000 homeless civilians driven from occupied territory, the public health need is inconceivable. In addition to medical supplies, eighty-four scientific journals are microfilmed regularly and fourteen copies sent to China. From a small beginning in 1937, last year the bureau distributed about $2,000,000 in funds and supplies, supplementing assistance rendered by the American Red Cross and the Lend Lease Administration.

*The bureau makes no direct appeals for financial support, having become, in 1941, one of the agencies participating in United China Relief. Direct contributions to the Bureau at 1790 Broadway, New York 19, N. Y., while welcome, are counted as part of the total funds raised by United China Relief. Local Community and War Relief Chests would be credited with any direct contributions from localities where these chests exist.

THE DR. WILLIAM BEAUMONT MEDICAL FOUNDATION, INC.

THE historic experiments of Doctor Beaumont on Alexis St. Martin are usually associated in the minds of medical men with Mackinac Island. That many of these first experiments were performed at Prairie du Chien, Wisconsin, is not generally known.

It was in June, 1822, at Mackinac Island, that the shotgun accident occurred to the French Canadian, Alexis St. Martin. Under the care of Dr. William Beaumont, an army surgeon, the injured man recovered, a stomach fistula remaining. St. Martin was supported and treated by Doctor Beaumont in his home for nearly two years. In May, 1825, he began making his famous experiments with human digestion. In August, 1825, however, St. Martin ran away to Canada, and it was not until 1829, after Beaumont had been transferred to Ft. Crawford at Prairie du Chien, that the doctor learned of his whereabouts and induced him to bring his family to Prairie du Chien, to again enter his employ. Between

December, 1829, and March, 1831, about fifty-six experiments were recorded. In 1832, the doctor and patient moved to Washington, D. C., where 116 further experiments were conducted, followed by the publication, in 1833, of Doctor Beaumant's book entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion."

Dr. William Beaumont was born in Lebanon, Connecticut, in 1785. He suffered from defective hearing, the result of an accident in childhood, which became progressively worse. He studied medicine at St. Albans under Dr. Benjamin Chandler and received his license from Vermont in 1812, in time to enlist and serve in the War of 1812. Doctor Beaumont maintained a private practice in Plattsburgh from 1816 to 1820. In 1820, he reënlisted and was sent to Machilimacinac Island (now Mackinac Island) in the strait between Lake Huron and Lake Michigan. In 1828, he was assigned to Prairie du Chien, where a number of experiments on Alexis St. Martin were performed. It was Doctor Beaumont's ambition to take St. Martin with him to Europe in order to demonstrate his experiments to surgeons and scientists such as the great Swedish chemist, Berzelius. A leave of six months granted him in 1832 he considered insufficient and so never made the trip. After publishing his book, he was transferred to Saint Louis in 1834, resigned from the service in 1839, and enjoyed apparently a prosperous surgical practice in that city until his death in 1853. His was a valuable contribution to human physiology.

The experiments conducted at Prairie du Chien took place at the first Fort Crawford, the foundations of which were only recently uncovered during the construction of a municipal swimming pool in the grounds of Villa Louis, the restored residence of Hercules Louis Dousman, built in 1843, and now a public park. Incidentally, the old residence, now over 100 years old, is a fine example in construction and furnishings of a fine residence of that period when Chicago was no more than a village. For several years the spring opening of the Villa to visitors has been the occasion of appropriate ceremonies, including parade, horse show, and pageant in memory of the early days.

The second Fort Crawford, built on higher ground at Prairie du Chien, was destroyed by fire except for one wing. In 1943, the Dr. William Beaumont Medical Foundation, Inc., was founded, acquired title to the ruins of the fort, and is reconstructing it for use as a museum devoted to the memory of Doctor Beaumont and his work. A bronze tablet placed at this site in 1931 by the State Medical Society of Wisconsin, commemorates Doctor Beaumont's pioneer work. The undertaking has been endorsed by the Councilors of the State Medical Society of Wisconsin and by the local Crawford County Medical Society. The Foundation is adding to the $1,500 already raised for completing the restoration of the building and the preparation of exhibits. It is a unique and fascinating project which will appeal to medical men and historically-minded individuals. Those interested in making contributions may address M. J. Dyrud, 508 South Beaumont Road, Prairie du Chien, Wisconsin.

INFANTILE PARALYSIS GRANTS

Announcement was made at the May meeting of the National Foundation for Infantile Paralysis of grants totaling $1,128,770 for intensifying and broadening its work in poliomyelitis.

A grant of $320,000, which will cover a five-year period, was made to the University of Minnesota Medical School for expansion of the project already inaugurated there by the Foundation in the study of physiological problems and clinical application of physical medicine in connection with poliomyelitis.

Another long-term grant of $325,000 was made to the University of Michigan School of Public Health at Ann Arbor, to finance and operate an expanded virus study unit. Emphasis is to be laid on discovering, if possible, a practical and inexpensive method of identifying the polio virus, and provision will be made for the training of virologists.

Another grant of $175,000 was made to the Northwestern University Medical School to expand the Kenny Training Center already established there and the activities of the Department of Physical Medicine of the Medical School.

The remaining grants have been designated to organizations throughout the country active in virus research treatment and education in connection with poliomyelitis.

The discoveries of healing science must be the inheritance of all. That is clear. Disease must be attacked whether it occurs in the poorest or the richest man or woman, simply on the ground that it is the enemy; and it must be attacked just in the same way as the fire brigade will give its full assistance to the humble cottage as readily as it will give it to the most important mansion.—WINSTON CHURCHILL, *Lancet*, Mar. 11, 1944.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

CONGRATULATIONS TO THE LEAGUE OF WOMEN VOTERS

It is encouraging to note that the League of Women Voters, while interesting itself in all current proposals for improving the health of the people, has decided to throw its influence in Minnesota, not for compulsory sickness insurance, but for extension of public health districts throughout the state.

Public health activity, in the sense of protecting water and food supplies, controlling sanitation and preventing the spread of communicable disease, is definitely a proper concern of government.

Tax-supported departments of public health have made immeasurable contributions to the health of the American people, in spite of the fact that they have been meagerly financed and their activities hampered by official neglect and indifference.

As noted repeatedly in these columns, the logical place for government to start an all-out effort to improve the public health is with the greatly-needed expansion of the work of the organized public health department. The House of Delegates of the American Medical Association went on record in 1942 in favor of such expansion and urged the Trustees "to use all appropriate resources and influences of the association to the end that, at the earliest possible date, complete coverage of the nation's area and population by local, county, district or regional full-time health services be achieved."

At the present time, less than half of the people of the United States live in districts where there is adequate public health protection, directed by trained medical officers of public health. What is lacking is not the knowledge nor the necessary skills, but the support and interest of all units of government, local, state and national, in this fundamental need.

In Minnesota there are only four organized health districts outside the large cities; and the League can be of the greatest assistance to physicians and other public-spirited citizens who wish to foster sound progress in public health, if they will work vigorously to increase the number of these districts in the state after the war.

ONE YEAR OF SICKNESS BENEFITS IN RHODE ISLAND

Compulsory insurance providing cash disability benefits for wage earners is now one year old in Rhode Island. This is the first program of its kind anywhere in the United States; and it is to be followed, if the governor of the state has his way, by the first compulsory state hospital insurance plan.

As noted before in these columns, the cash benefit plan was initiated chiefly, because there was a large, unused reserve in the state unemployment compensation fund. Unlike most states, Rhode Island's plan called for a small employe-contribution to this fund. Instead of cancelling this contribution, it was decided to use it for cash benefits during employe illness or disability.

To the medical profession was given the responsibility for certifying the employe's eligibility to draw benefits; and after one year's operation, it is clear that the difficulties foreseen by the physicians have been realized. At the same time, the plan appears to have worked reasonably well, as judged by the fact that there has been a comfortable growth in the reserve fund although 26,500 claims have been filed of which 3,800 were disallowed. How it will work when the war is over and the employment picture changes, remains to be seen.

Medical Board Established

During the first few months of operation, the responsibility for certification was left entirely in the hands of the patients' own physicians without any check by an examining staff of the Unemployment Compensation Board in charge of the plan. Soon such a check was deemed necessary and now there is a medical board which may, if it wishes, check on a case directly after certification by the physician, or may wait to check until after a period of drawing benefits and before further payments are made.

The physicians naturally resented establishment of the board; but they have found, as it was found long ago in European countries, that determination of physical eligibility is a difficult problem, especially when complaints are largely subjective. When confronted with a patient who declares he feels unable to work, though the doctor thinks he can, the doctor may often have to make the choice between signing the claim or losing the patient to some other doctor who will sign the claim.

Certification may be made, under the law, by any licensed practitioner, furthermore, whether or not he is a doctor of medicine. Difficulties arise from that fact and from the paper work involved, which is considerable.

The board has expressed criticism of the practicing physicians in some cases but appears to feel that difficulties stem from unconscious rather than from conscious bad faith.

Weekly benefit checks average about $17 and may be paid for a total of 20 weeks in any calendar year. Inasmuch as Rhode Island is a highly industrial state, it is estimated that over 90 per cent of all gainfully-employed workers participate in the program.

Hospital Care to Come

The plan for compulsory hospital insurance was proposed by Gov. J. Howard McGrath because, in his opinion, cash disability benefits meet only part of the problem of illness and because a satisfactory state program would eliminate the dangers of a federal program in the hospital field. The governor's plan provides that the insurance should be carried by private carriers, the suggested law making it mandatory that employes be covered by contracts offering stipulated minimum benefits and that the hospitals be paid direct for their services. Such contracts could be made either with the Blue Cross or private insurance companies. Details of this plan remain to be worked out and the bill is not expected to be ready for submission to the legislature until 1945. Gov. McGrath is said to be considering extension to cover medical and surgical services, too; but that development would hinge, apparently, upon the success of compulsory hospital insurance.

BRITISH DOCTORS AND THE WHITE PAPER

The published reaction of the British Medical Association to long-range plans of the Churchill government for a state salaried medical system in Britain might well have come from American doctors with reference to the Wagner-Murray-Dingell Bill.

The British association is fighting state-hired medical service while their American colleagues are fighting compulsory government health insurance; but their policies and even their phraseology in opposition have much in common.

For instance, the Council of the British association would like to have a central administrative body dealing exclusively with civilian health and medical functions of the central government, according to a report printed in a recent issue of the London *Daily Mail*. British doctors want this body to be headed by a Minister who will be responsible to Parliament. American doctors also want a department of health, headed by a cabinet member in our own government.

They Fear Bureaucracy

The British Medical Association also fears political influence in medical matters and dislikes bureaucracy and the "departmental mind" in the care of the sick.

Government health insurance has existed for many years in England, of course; but the reorganization planned by the Government after the war is apparently as disturbing to British doctors as the possibility of government health insurance is to medical men in the United States.

Nine Points

Following are nine points drawn up by the British Council of which the King's physician, Lord Dawson of Penn, is a member, as they were summarized and published in the *Daily Mail*.

1. Doctors, as members of an expert profes-

sion, should not be subjected to nonexpert direction by Civil Servants.

2. They object to the profession being controlled by the Treasury or the "Treasury Outlook."

3. They oppose "civil direction" in peacetime; they do not want a doctor to be told by a Civil Servant where to practice.

4. The "White Paper" (Government outline of postwar health plans for Britain) called for a "high degree of certification." This, they say, might mean that a doctor, convinced that a patient needed a week off from work, would not dare to give a certificate because he might be questioned by a Government inspector.

5. The Government plan, in practice, would destroy the doctor's professional freedom and the doctor-patient relationship.

6. They oppose any attempt to introduce, insidiously, by means of health centers, the idea of a state-salaried service, because it would substitute for the present loyalty to patients, a loyalty to the state.

7. The "health areas" into which the country is to be divided are too small and will multiply, instead of reducing "the departmental mind."

8. Health centers should be built slowly and be the fruit of accrued experience and not limited, as proposed, to surgery.

9. The White Paper makes no provision for training in, or practice, of preventive medicine.

"Doctors Will Resist . . ."

"The profession," says the association, "is not prepared to see itself converted into a branch of central or local government or to become a 'collectivized unit' within a free economy.

"Doctors will resist any control by the State, either political or administrative, which is inconsistent with their intellectual and professional freedom."

They Know the Departmental Mind

It should be recalled that British doctors have already had considerable experience with what they term, "the departmental mind" since they are obliged to conform to departmental regulations in many phases of insurance practice where Civil Servants hold the purse strings.

The American doctor, on the other hand, is still free to practice without any restrictions except those imposed by licensure and the ability of the patient to pay. This last can be and is, with great regularity, surmounted by individual arrangements for long-term credit or by philanthropy, as the occasion demands.

BACKGROUND IN BRITAIN

Strangely enough, the radical British White Paper, issued in February this year, is the product of health planning by a conservative government.

The chain of events leading up to it runs back many years to the National Health Insurance Act which became effective in 1912. This act was limited in scope, providing only care from a general practitioner and not including either specialist or hospital service. It was open only to employed persons below a certain income and not to members of their families. The British Medical Association opposed the Health Insurance Law of 1912; but by 1930 it was recommending extension of the act to include specialists' services and to cover families of insured persons. It was generally recognized by that time that there was need for more fully available hospital service and for correlation with school medical services and public health; but the depression halted any major expansions for a number of years.

Planners Have Their Say

The war, however, has brought changes to the hospital system and stimulated both professional and lay bodies to plan for future health services. Since 1941 many leading professional bodies and several important nonmedical ones have issued reports on postwar plans. The report of the Medical Planning Commission of the British Medical Society, calling for encouragement of group practice and the expansion of insurance coverage to approximately 90 per cent of the population, appeared in June, 1943. In November came the Beveridge Report, presented by Sir William Beveridge at the official request of the Government. The Beveridge report dealt with the entire field of social sceurity but included plans for a comprehensive health service. An organization of young physicians presented a report shortly afterwards, following, in the main, the Beveridge principles. The Society of Medical Officers of Health recommended a universally available state-salaried medical service. The British Labour Party and the Socialist Medical

Association took the same ground. On March 21, 1943, Winston Churchill declared in a world-wide broadcast: "We must establish, on a broad and solid foundation, a National Health Service." The Government conferred with many bodies including the British Medical Association and the White Paper contains the statement of its proposals.

Dominions' Plan, Too

It should be noted, at the same time, that Canada, Australia and South Africa are all reported engaged in working out similar plans for expanded national health schemes, either on the insurance or the state-salaried basis.

New Zealand made certain health benefits available to all citizens in its Social Security Act of 1938. Maternity benefits went into operation in May, 1939, hospitalization in July of the same year and general practitioner service in 1941. The New Zealand plan has run into difficulties partly because of opposition of the medical association and partly because of a severe shortage of doctors. Experience, there, is generally reported by both doctors and laymen as highly unsatisfactory.

U. S. Alone

The United States, alone, among the great nations of the world, still retains in toto its system of private practice for all ordinary medical services. The system is now undergoing its first serious legislative threat with the introducion in this Congress of the Wagner-Murray-Dingell Bill. Physicians are almost unanimously opposed to this bill; but it seems clear that they, themselves, must now formulate and push action on an effective country-wide health policy if they wish to save the private practice of medicine in the United States.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. DuBois, M.D., Secretary

License of Minneapolis Physician Suspended for Five Years for Drug Addiction

In the Matter of the Revocation of the License of Donald Laing Peterson, M.D.

The Minnesota State Board of Medical Examiners on May 12, 1944, suspended for five years, the medical license held by Dr. Donald Laing Peterson, 2901 4th St. S. E., Minneapolis. Dr. Peterson was cited by the Medical Board following his plea of guilty on March 8, 1944, in the United States District Court at Minneapolis to an indictment charging him with violating the Harrison Antinarcotic Law on two counts. On March 25, 1944, Dr. Peterson was ordered by Judge Gunnar H. Nordbye to place himself in the United States Public Health Service Hospital at Lexington, Kentucky, for treatment for drug addiction.

Dr. Peterson was born at Casselton, North Dakota, in 1908, and received his Doctor of Medicine degree from the University of Minnesota in June, 1933. Prior to practicing in Minneapolis, Dr. Peterson was located at Fargo, North Dakota.

Minneapolis Physician Loses Basic Science Certificate and Medical License

In the Matter of the Revocation of the License of Orel A. Kibbe, M.D.

On May 12, 1944, the Minnesota State Board of Medical Examiners formally cancelled the license to practice medicine held by Dr. Orel A. Kibbe, 4316 Upton Ave. So., Minneapolis. Dr. Kibbe, 63 years of age, had previously entered a plea of guilty in the District Court of Hennepin County to the crime of abortion. Dr. Kibbe's basic science certificate was cancelled by the Minnesota State Board of Examiners in the Basic Sciences on April 4, 1944, for the same reason.

PREVENTABLE DISEASES STILL UNCONTROLLED

As a nation we still permit smallpox, diphtheria, whooping cough, tetanus, typhoid, tuberculosis, rheumatic fever, and dozens of other preventable diseases to take their annual toll. To be sure, we have made great progress in bringing them under better control in recent years, but let no one think for a single moment, that these killers of mankind are incapable of returning to the scene of their previous triumphs should we relax temporarily in our efforts to keep them in check.—Earl E. Kleinschmidt, M.D., *Ohio State Medical Journal*, March, 1944.

Minneapolis Surgical Society

Meeting of January 6, 1944

Vice President Daniel MacDonald, M.D., in the Chair
Secretary, John M. Feeney, M.D.

TUMOR OF THE BREAST

MARTIN NORDLAND, M.D., F.A.C.S.
Minneapolis, Minnesota

This case report is concerned with a tumor of the breast in a single woman nineteen years of age. She had noticed a hard lump in the left breast for about a year. In recent months the mass had become rapidly larger and was quite tender. She had noticed that the mass was well defined.

The patient's past history was irrelevant. She had always been in good health. There was no history of trauma. Examination revealed a healthy young woman with good color. Both breasts were of average size. In the left breast in the lower half was a large mass, well defined, which involved about one-third of the breast, extending well up to the nipple. The mass described was removed. The pathological report was as follows:

Macroscopic Specimen: Tumor of the breast encapsulated and about the size of a goose egg. When the capsule is cut the contents show it to be lobulated, papillomatous masses, whitish to pale pink with a large number of them so that the cut tumor forms a mass 9 cm. across and 7 cm. through.

Microscopic Specimen: The tissue shows a fibrous mass containing glands.

Diagnosis: Papillary fibro-adenoma, benign.

The unusual condition about this case was the fact of the presence of this large tumor in a very young patient. The problem consisted of preserving the breast. She had been advised to have the entire breast removed. It was possible to remove this mass without disfiguring the breast.

Numerous cases have presented themselves from which breast tumors have been removed leaving unsightly scars and marked deformities of the breast. I believe that many times enough caution is not exercised in surgery of the simple, nonmalignant tumors of the breast. The psychological factor should be taken into consideration, particularly in these young individuals. The pathologic report of this tumor reveals it had an unusual appearance and the microscopic picture revealed unusual morphological tissue.

Discussion

DR. MCCARTNEY: These are like any other benign tumor. If they are not completely removed, they will recur. When you do find a fibro-adenoma developing after one has been removed, it does not mean that it recurred because it is malignant. Sometimes large numbers of fibro-adenomas arise in the same breast.

CARCINOMA OF BOTH BREASTS

Report of Three Cases

G. R. DUNN, M.D.
Minneapolis, Minnesota

Following the operative removal of one breast for carcinoma, a malignant growth occasionally develops in the other breast. Whether the growth in the second breast is a primary new growth or is metastatic in origin, can rarely be determined with accuracy. If, however, the following criteria are met, the evidence very strongly suggests that the second growth is a primary carcinoma:

1. The diagnosis of carcinoma must be confirmed by microscopic examination of each growth.

2. An interval of five years should elapse between the operative procedures.

3. The carcinoma found in one breast should be of a different type than the carcinoma of the second breast.

4. There should be no evidence of metastatic carcinoma elsewhere in the body.

Obviously, on occasions, a primary growth may develop in the second breast at a comparatively short period of time following the first operative procedure and two primary growths may be of the same type.

Case 1.—An unmarried woman, forty years of age, was examined November 11, 1939. A radical operation (Halsted) had been performed at the Midway Hospital by Dr. King on October 10, 1934, and the microscopical diagnosis was medullary carcinoma of the left breast with metastasis to the axillary glands. There was no evidence of recurrence at the time of our examination five years after operation. Examination of the right breast disclosed a poorly defined, small mass in the upper inner quadrant of the right breast. On manipulation of the breast, definite retraction of the skin occurred over the mass. There was no enlargement of the axillary glands. X-ray of the chest was reported normal. On December 9, 1939, a Halsted operation was performed for carcinoma of the right breast. Frozen and paraffin sections showed scirrhus carcinoma of the right breast without involvement of the axillary glands. Even in this case the pathologists considered the possibility of metastasis for they felt that the right breast showed two separate areas of malignancy. The carcinomata occurring in the right and left breasts were of

different types as shown on miscroscopic examination. An interval of over five years intervened between the two operative procedures and when last examined, December 30, 1943, the patient exhibited no signs of recurrence—over nine years after the first operative procedure and over four years after the second operation.

Case 2.—An unmarried woman, forty-three years of age, exhibited a firm, irregular mass in the upper portion of the left breast. Definite retraction of the skin occurred over this mass on manipulating the breast. No axillary glands were palpable. On March 25, 1939, a Halsted operation for carcinoma of the left breast was performed. The microscopic diagnosis was scirrhus carcinoma without axillary metastasis. A series of x-ray treatments was given postoperatively.

A little over two years later, on April 28, 1941, a small mass in the breast tissue was noticed about two inches above the right nipple. Retraction of the skin occurred over the small mass on manipulating the breast. There were no other palpable masses in the right breast. A supraclavicular node was palpable on the left. X-ray of the chest was reported normal. On April 29, 1941, a Halsted operation for carcinoma of the right breast was performed. The microscopic diagnosis was scirrhus carcinoma of the right breast without metastasis to the axillary glands.

The enlarged supraclavicular gland was removed on the left side. This showed metastatic carcinoma. A series of x-ray treatments followed. Today the patient has generalized metastases.

Clinically, the tumor of the right breast appeared to be primary. The growth was small and there was only one area of carcinoma in the right breast. However, the interval of time between the two operations was only a little over two years; the growths were of the same variety, the original growth in the left breast had metastasized to a supraclavicular gland and the patient now has generalized metastases. The carcinoma of the right breast may have been a metastatic growth.

Case 3.—A woman sixty-nine years of age was examined on July 9, 1940. There was a poorly defined lump in the left breast but definite retraction of the skin was evident over the mass on manipulation of the breast. On July 12, 1940, a Halsted operation was performed for carcinoma of the left breast. Pathologic examination showed scirrhus carcinoma of the left breast without involvement of the axillary nodes. The patient did not wish x-ray treatments. The patient was examined at frequent intervals and on July 14, 1941, on manipulating the right breast a very slight but constant dimpling of the skin was noticed to occur about one inch to the right of the nipple. There was no palpable mass with the patient in the sitting or in the prone position. X-rays of the chest were reported negative. No metastasis could be found elsewhere. On July 18, 1941, a Halsted operation for carcinoma of the right breast was done. The pathological report was as follows: Grossly the breast shows a small scirrhous carcinoma about 5 mm. in diameter; four lymph nodes from the axillary nodes show no gross involvement. Microscopical examination shows scirrhous carcinoma of the breast; no involvement of the lymph nodes. The patient died November 5, 1943, of internal metastasis. There was no local recurrence in either operative field. These tumors were of the same variety. The tumor of the right breast became evident a year after the first but no recurrence was manifest in either operative field. The carcinoma of the right breast may have been metastatic in origin.

Carcinomata of both breasts, whether primary or metastatic, seem to occur with some frequency, and inasmuch as these patients are usually having periodic examinations, we have an excellent opportunity for early diagnosis. This is demonstrated in Case 3 of this series where one was able to make the diagnosis of carcinoma of the right breast before a palpable mass was present.

Unfortunately, the mortality is high. One would expect approximately a 100 per cent mortality in the cases in which the second breast is involved by metastasis and a high mortality in the cases in which a primary lesion develops in the second breast.

Discussion

DR. MCCARTNEY: This question of whether we have to do with multiple carcinomas or metastasis is something that confronts us every now and then. I have seen several instances of bilateral carcinoma of the breast and the question of whether there was a new primary tumor or metastasis always came up. We know that in other parts of the body a number of primary tumors may occur and we have what appear to be primary, independent malignancies, and we do not even consider the possibility that one is primary and the others metastases; we consider them all primary tumors.

I saw several years ago five different areas in a breast, any one of which made an acceptable primary tumor. Whether one was primary and the others lymphatic permeations through the breast, or whether there were four or five different primaries developing at the same time, we cannot tell. Looking at each one individually it made a primary carcinoma of the breast. Bilateral cancers occur in about 8 per cent of the instances, but it is not clear whether they are primary in the first breast and the other represents a metastasis. If one had tumors which definitely differed, you might be willing to say that this is a new tumor and not a metastasis from the one which had been removed. But that is not entirely safe. I recall an instance where in one and the same section there was scirrhous, medullary and gelatinous tumor. The chances of getting different types of tumor in the same breast is not great. Scirrhous tumors make up 90 per cent of the cases, leaving about 10 per cent for medullary and the ones we call adeno- or gelatinous carcinomas.

The time interval is again not a sure method of differentiation. To say that a given length of time is a dividing point between metastasis and a second primary is hardly a safe criterion, but we feel that when a number of years has elapsed between the two tumors in the breast, we are dealing in all probability with an independent second or new tumor and not a metastasis from the original tumor.

DR. R. C. WEBB.—Primary carcinoma of both breasts is not a particularly rare condition, but such case reports are interesting, and they may serve as an additional argument for the radical and complete operation as emphasized by Dr. Dunn. From time to time during recent years we have heard surgeons advocating simple mastectomy in many cases of carcinoma of the breast because of the poor results from the more radical surgery. We also occasionally see surgeons performing a semiradical or incomplete operation, and we are led to wonder if the pessimistic attitudes of advocates of simple mastectomy are the cause of these incomplete procedures.

It was just fifty years ago, in 1894, that Dr. Halsted wrote several papers on carcinoma of the breast advocating the complete radical operative procedure for removal of the cancerous breast. His arguments are still good, and they can be profitably re-read by those interested in this type of surgery.

In order to introduce a more cheerful note in this argument I would like to add two brief reports of patients who have had primary carcinoma of both breasts. One of these patients has survived her second operation sixteen years and the other developed her second

breast carcinoma sixteen years after her first breast carcinoma.

Case 1.—A woman fifty-three years of age was referred to me in July, 1926, by Dr. T. A. Peppard. She complained of a lump in the left breast of one week's duration. The tumor was located in the lower outer quadrant of the breast and it felt about the size of a small walnut. It was freely movable on the underlying tissues, but there was dimpling of the skin.

On July 3, 1926, she was operated upon at the Asbury Hospital, and a radical complete operation was performed on the left breast, removing the breast and both pectoral muscles and the axillary contents.

The tissues were examined at that time by Dr. Floyd Grave, and they have recently been reëxamined. The report is as follows:

"July 3, 1926—The tumor mass removed from the lower outer quadrant of the left breast measures about 1.5 centimeters in diameter. The outline is indefinite. Fibrous rays extend from the tumor mass into the surrounding breast tissue. Cut surface shows linear markings and whitish chalk-like dotted surface.

"Section shows the tumor to be made up of rather large epithelial cells which are diffusely scattered. There are some large irregular shaped nests and some linear cords. Some of the smaller ducts are also filled with epithelial cells. The fibrous tissue in the breasts is increased. It has caused atrophy of some of the tumor cells. There was no evidence of axillary metastasis. Diagnosis: Scirrhous carcinoma."

In January, 1928, sixteen years ago and one and one-half years after her operation on the left breast she returned at the age of fifty-five years with a tumor in the lower half of the right breast just lateral to the midline. The tumor was about the size of a hazelnut.

On January 31, 1928, she was operated upon at the Asbury Hospital, and a similar complete radical operation was performed on the right breast.

The tissues were examined by Dr. Floyd Grave at that time, and they have recently been reëxamined also. The report is as follows:

"January 31, 1928—A small tumor about one centimeter in diameter was removed from the right breast in the midline just below the nipple. It is a solid tumor, the surface of which retracts when cut. It shows whitish linear markings.

"Section shows a marked fibrous tissue reaction which encloses numerous small nests of epithelial cells, and there are small cords of similar type cells. The cells are very irregular in size and shape and stain irregularly. The mitotic figures are present.

"Diagnosis: Scirrhus carcinoma."

She is now seventy-one years of age and annual examinations have shown no sign of recurrence.

The fact that this patient has lived sixteen years after the second radical operation for carcinoma of the breast should be an argument for its being a second primary growth and not a metastasis from the first carcinoma.

Case 2.—A woman sixty-nine years of age consulted me in February, 1926, complaining of a tumor of the left breast of a few weeks' duration. The tumor was about the size of a hazelnut and was freely moveable in the tissues of the upper outer quadrant.

A complete radical mastectomy was performed at the Asbury Hospital on February 15, 1926.

The pathologic diagnosis by Dr. Floyd Grave was scirrhous carcinoma.

She remained free from further evidence of carcinoma until November, 1936, when she returned with a tumor the size of a walnut directly under the nipple of the right breast. She is now eighty-five years of age. She was sent to the hospital for operation but on the morning of operation she developed a fever which was followed by bronchopneumonia. The operation was as a result postponed until January 19, 1944, when, because of her age and condition of health, a simple mastectomy was performed.

Dr. J. S. McCartney reviewed the sections from the first carcinoma of sixteen years previously and examined the tumor of the right breast with the following report:

"The sections from Asbury Hospital No. 4121, February 15, 1928, show a very fibrous tumor, approximately 75 per cent being fibrous tissue and 25 per cent epithelium and should be called scirrhous carcinoma. The sections No. 044-75, January 19, 1944, show that more than 75 per cent is in the form of coarse masses of epithelial cells with no differentiation into glands and should be called medullary carcinoma or carcinoma simplex."

LIGATION OF FEMORAL VEIN IN THROMBOPHLEBITIS

ARTHUR F. BRATRUD, M.D.
Minneapolis, Minnesota

This patient, a man thirty-four years of age, was first seen and examined at his home on September 18, 1943. At that time his chief complaints were:

(1) pain and swelling of the right leg below the knee and extending to just above the level of the joint; (2) fever; (3) weakness; (4) pain in the right leg on movement or walking.

He stated that about the third week in August, he had an infected finger incised and immediately thereafter started for New York on a buying trip. He stated that he very often scratches his fingers on sharp price tags on furs and that very often an infection will develop. He thought this was the onset of the infection. While on the way to New York City the infected finger was pressed so as to force out the pus. While in New York City he began to have pain and swelling in the right leg. A physician was consulted and a diagnosis of phlebitis of the long saphenous vein was made and he was advised to apply hot packs and rest. After his return home this was continued. A letter was received by the patient from his physician in New York City, which stated he hoped a competent surgeon had already performed a high vein ligation. Ligation of the long saphenous vein at the sapheno-femoral junction was performed. Two days later he was complaining of quite severe pain in the thigh and Dr. McPheters was called. He was admitted again to New Asbury Hospital on September 28, 1943. He had a very severe pain in the right lower chest and right upper abdomen. This was associated with marked coughing and expectoration of bloody sputum. Ligation of the superficial femoral vein was considered. Request for consultation by Dr. Spink was made and he was seen by Dr. Spink on October 1, 1943, and again on October 4, 1943. Consultation reports are as follows:

"October 1, 1943. Pulmonary embolism with infarction following thrombophlebitis is a good possibility. Location is near pleural surface and he may develop effusion.

"℞: I would keep sulfadiazine level around 7 mgs., which will require 1 gm. q., four hours after initial dose of 3 gm. I would give soda bicarbonate gm. 3 q.i.d.,

while receiving sulfadiazine and keep fluid output about 1,000 c.c. He should be getting from 2,500 to 3,000 c.c. fluid daily.

"October 4, 1943.—Patient was seen again tonight after consultation with Dr. Bratrud. Patient is febrile—more so—and the pain has radiated more anteriorly. Nevertheless, he is able to breathe fairly deeply and with normal rate. On examination, marked dullness at the base with very distant breath sounds and voice sounds. At base, breath and voice sounds are absent. No rales present.

"I believe febrile reaction is compatible with chest pathology—which is more extensive. He may have an effusion. If this is confirmed by x-ray, he should have thoracentesis. My only concern now is the possibility of lung abscess developing in the infarcted area. Suggest leukocyte count.

"X-ray findings on September 29, 1943, were as follows:

"A single plate was taken of the chest. Both diaphragm shadows are clear. There is no evidence of fluid. The heart and aorta are within normal limits as to size, shape and position. There is a definite pneumonia, either broncho or virus in type, in the lower lobe of the right lung.

"Conclusions: Pneumonia, either broncho or virus in type, lower lobe of the right lung.

"X-ray findings on October 5, 1943.—A single plate was taken of the chest at the bedside and compared with examination of September 29, 1943. There has been a marked spread in the pneumonia in the lower right lung.

"Conclusions: Marked spread in the pneumonia in the lower lobe of the right lung when compared with the examination of September 29, 1943. The left chest remains negative."

On October 14, 1943, another radiograph was made of his chest which showed there had been a marked clearing in the lower portion of the right lung.

On October 18, 1943, he was seized with another attack of severe pain in the upper right chest with marked dyspnea—high fever—severe cough with expectorations of blood. Consultation was requested by the physician in New York City and Dr. Kinsella was called. His report is as follows:

"History of infected thumb—right thrombophlebitis—ligation and subsequent pulmonary embolism, right base—this area gradually resolved. On October 18, 1943, another sudden attack of pain in the right chest, this time higher up—later expectorated blood—fever, et cetera. Another pulmonary embolism.

"No evidence of abscess to date. Possibly a small amount of fluid or pleural reaction—not enough to warrant attempt at aspiration. Watch for increase.

"℞: 1. Keep quiet.

"2. Sympathetic treatment.

"3. Chemotherapy as tolerated.

"4. Watch for abscess and fluid by x-ray."

After the second infarct he did get some relief from being put in the oxygen tent. More consultation was requested and he was seen by Dr. Dennis. His report is as follows:

"October 24, 1943.—From the story which the patient presents, the first episode of chest pain must have been a pulmonary embolism. About the second episode there is reasonable doubt, for the pain gradually increased over a period of hours and hemoptysis did not appear for three days. In any case, the saphenous ligation was done before either episode, and the deep veins must therefore also be involved. At the present time the patient has tenderness in the calf and along the course of the femoral. The right thigh is 1 cm. larger than the left and definitely warmer. Heparin is not indicated because of hemoptysis and it is too late to expect benefit from a sympathetic block. The course recommended, therefore, is either prolonged bed rest, or, preferably, ligation of the femoral, with ligation also of the iliac if clot is found in the femoral. Preliminary venogram is now impracticable."

On October 31, 1943, he was seen again by Dr. Dennis, at the wife's insistence, and after talking to Dr. Lee, in Dr. Bratrud's absence. Considerable edema persists in the right leg.

After he was seen by Dr. Dennis, consent for femoral vein ligation was given. On October 27, 1943, common vein ligation was performed, after which no more infarcts were thrown off. There was no clot at the level of the section of the femoral vein but due to the fact that he had complained of aching pains in the thigh, the femoral vein was ligated above the *Profunda Femoris*. The question of a sympathetic block of the right cervical sympathetic was considered on account of the severe excruciating pain in the right upper chest, but as he seemed to be improving, this was not performed.

X-rays, taken on October 13, 1943, were as follows:

A radiograph was made of the chest and compared with the examination of October 5, 1943. There has been quite marked clearing in the infiltration in the lower portion of the right lung.

On October 19, 1943, radiographs of the chest showed the following findings:

The left lung showed no change, there had been a definite extension of the infiltration in the upper half of the right lung.

Preliminary radiographs made of the gall-bladder region showed no evidence of gallstones. There was no evidence of a gall-bladder shadow.

There was an increase in the trabeculations in the first lumbar vertebra which probably represented a hemangioma.

On October 25, 1943, the following findings were present:

The infiltration at the base of the right lung has nearly completely resolved. There has been an extension in the right upper lobe.

Conclusions: Negative left lung. There has been an extension of the pneumonia in the right upper lobe with some resolution in the base. This lesion in the right upper lobe should be checked in a few days for the possibility of early cavitation.

On October 28, 1943, the x-rays showed partial resolution of the infiltration of the right upper lobe, with some mottling—suggestions of early cavitation.

(Continued on Page 580)

✦ Reports and Announcements ✦

MEDICAL BROADCAST FOR JULY

The following radio schedule of talks on medical and dental subjects by William O'Brien, M.D., Director of Postgraduate Medical Education, University of Minnesota, is sponsored by the Minnesota State Medical Association, the Minnesota State Dental Association and the Minnesota Hospital Association.

July 1— 9:30 a.m.—WCCO—Dysentery
July 1—11:30 a.m.—WLB-KROC—Medicine in the News
July 8— 9:30 a.m.—WCCO—Infantile Paralysis
July 8—11:30 a.m.—WLB-KROC—Medicine in the News
July 15— 9:30 a.m.—WCCO—Typhoid Fever
July 15—11:30 a.m.—WLB-KROC—Medicine in the News
July 22— 9:30 a.m.—WCCO—Swimmer's Itch
July 22—11:30 a.m.—WLB-KROC—Medicine in the News
July 24— 4:15 p.m.—WCCO—Your Hospital in Wartime—The Need for Volunteers
July 29— 9:30 a.m.—WCCO—Children's Dentistry
July 29—11:30 a.m.—WLB-KROC—Medicine in the News

REFRESHER COURSE IN OTOLARYNGOLOGY

The University of Illinois College of Medicine announces that its fall didactic and clinical refresher course for specialists in otolaryngology will be held at the college from September 25 to 30, inclusive. The fee for the course is $50.00. Since registration is limited to twenty-five, applications should be filed as early as possible. Write for information to Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12, Illinois.

AMERICAN BOARD OF OPHTHALMOLOGY

The American Board of Ophthalmology has recently moved into new quarters at Cape Cottage, Maine. All communications should be sent to this address in the future.

The third edition of the Directory of Medical Specialists listing names and biographic data of all persons certified by the fifteen American Boards is to be published early in 1945. Collection of biographic data of the diplomates certified since the 1942 edition, and revision of the older listings in that volume are now going forward rapidly. Diplomates are requested to make prompt return of their notices regarding their biographies as soon as possible after receiving the proper forms from the publication office soon to be mailed to them.

Board examinations for 1945 are scheduled as follows:

Los Angeles, January. During Mid-Winter Course (This examination to be held if the number of applications warrants it). *Deadline* for applications: October 1, 1944.

New York City, June. Exact dates to be announced in various journals about January 1. *Deadline* for applications: December 1, 1944.

Chicago, October. Exact dates later. *Deadline* for applications: April 1, 1945.

Note: All examination dates are contingent on war and transportation conditions.

Please write at once for application blanks to: American Board of Ophthalmology, Cape Cottage, Maine.

Ligation of Femoral Vein in Thrombophlebitis

(Continued from Page 578)

On November 2, 1943, the x-ray film showed postpneumonic pulmonary abscess, upper lobe, right lung. Only at one time after the femoral vein ligation did the patient show any marked rise in temperature, October 27, at which time it reached 100 degrees. Blood sulpha determinations were taken regularly up to the time of the femoral vein ligation. He continued to have a very slight temperature at times up to the time of his discharge on December 1, 1943. At times he would complain of weakness and felt as though he were going to faint, but as he was of a very neurotic type, it was not considered very seriously. He complained of pain in the region of the right knee a great deal of the time.

X-rays taken November 24, 1943, showed no evidence of localized bony erosion or bony trauma in the region of the knee. X-rays of the chest at this time showed further resolution of the infiltration in the upper lobe of the right lung with some thickening on the pleura at the base of the right lung. After the vein ligation the foot was elevated and hot packs were applied. There was a moderate amount of swelling of the thigh and leg, but at no time was any cyanosis present. He was discharged from the hospital on December 1, 1943. He was seen at his home several times after his discharge from the hospital and seemed to be doing very nicely, though at the time he complained of weakness. He developed a sore throat on December 14, 1943, and Dr. Davis was called. Since then he complained of pain in his left chest with shortness of breath and he was hospitalized again. It is very possible that he has had more infarcts thrown off from the thrombophlebitis of the left leg. Had he not improved so nicely while at New Asbury Hospital a venogram of the left leg would have been made.

In reviewing the case, there is no doubt that pulmonary complications and even death could be avoided by femoral vein ligation where a positive venogram is present or where there is positive evidence of a thrombophlebitis or phlebothrombosis.

Communication

To the Editor:

The editorial in the June issue on "Premarital and Prenatal Examinations" would indicate the need and desirability of the publication of additional information on this subject, especially as it pertains to Minnesota. It has been rather impossible during the past two or three years to do justice to publications because of the vastly increased amount of work associated with Selective Service and a personnel not commensurate with this increase. Much of this work in relation to Selective Service and venereal disease is of a character requiring immediate attention and must be completed each day regardless of anything else. Reference in particular is to the increase in laboratory work since the laboratories of the Division of Preventable Diseases have undertaken all tests required by Selective Service and the detachments of the armed forces located within the state. Blood tests reached a peak of 2,800 daily with a resultant increase in clerical, filing, and stenographic work. The writer's correspondence in relation to this work has averaged between four and five hundred letters per week. It is worthy of mention that performing of blood tests for Selective Service has been no mere routine in Minnesota (as in most states) since here a second test has been made in every Selective Service individual who had a questionable first test, and this second test has not been simply a repetition of routine but a complete serological study with seven different tests. So far as is known, no other state has done so complete or thorough a piece of work.

Investigation of all sources or contacts of men in the service found infected has been given immediate attention. In carrying out this work, much of the time with a shortage of help, it has been next to impossible to find time to correlate or tabulate data, let alone prepare it for publication.

The fact that there is no specific law in Minnesota requiring premarital examination or prenatal blood tests is not due to lack of consideration. It has been given most careful consideration. In relation to two previous sessions of the Legislature this matter has been thoroughly discussed with groups of sponsors of such a law and on each occasion when the facts have been made clear it was agreed that such legislation would have little value here and no bill was introduced.

The control of venereal disease presents a problem quite different as to detail in various states or even communities. The problem in a state with a high incidence of early infectious cases as well as a high morbidity rate is vastly different from that in a state where the percentage of infectious cases is low as well as the general morbidity rate. Plans for an urban community are not entirely applicable to a rural community. In relation to the above statement, it is true that nearly every state below the Mason and Dixon line referred to in the editorial has a high morbidity rate with literally thousands of early infectious cases. Minnesota has one of the lowest rates in the entire country, only about twelve per cent of reported cases being of the early infectious type. Actually in 1942 only 240 cases out of a total of 2,359 were listed as early infectious, in 1943 only 244 of a total of 1,879 were recorded as early infectious.

During and immediately following World War I practically every state undertook a program for venereal disease control. Minnesota was the second state to appropriate funds and undertake this work. The writer had the opportunity of organizing the work in California, which was first, and also of organizing and

directing the work in Minnesota. Unfortunately, in all but a very few states the program was regarded as a war emergency, appropriations were not continued, and all effort lapsed, to be undertaken again only with the appropriation of Federal funds about ten years ago. Minnesota was one of the few states to continue its program consistently from 1918 to the present time. This and the active coöperation of Minnesota physicians account in large measure for the fact that Minnesota is one of five states to show radically lower rates than most other states, as indicated in Selective Service examinations. (Report in *AMA Journal*, Dec. 26, 1942.)

Aside from its educational value a premarital examination law is aimed at uncovering infectious cases and thus preventing spread of the disease and birth of diseased babies. So far as is known, no law, even if enforced one hundred per cent, can completely accomplish these ends. Regardless of what period of time is set for taking the test previous to granting a license, exposure and infection acquired two or three weeks before the blood test would unlikely show a positive test and might show no clinical evidence upon examination, since there is often no evidence of infection for two or three weeks following exposure and it is often four to six weeks after exposure before a blood test becomes positive. Thus there is ample opportunity to miss a case which may be in its most infectious stage at the time of marriage. In the thirty or more days following the taking of a blood test and examination there is certainly ample time for an individual to become infected, and again the case is missed and becomes a very real danger at the time of or immediately following marriage. Almost all of these laws have a clause which makes it possible to grant permission for a marriage to take place without examination; this allows possible opportunity for evasion and collusion. As a matter of fact, substitution of blood is possible at any time.

Practically, nearly every examination is going to depend upon a blood test. In spite of all effort to standardize and to bring all accepted tests to the same degree of specificity and sensitivity they will vary; this means that a person may have one test positive and another negative on the same specimen; a person may very well be positive in one state and negative in another depending upon the routine tests used. Because of such possible variations the physician is warned by almost all laboratories not to diagnose syphilis on a single positive test nor to regard a single negative as indicating the absence of the disease, and yet I know of no premarital examination law which requires examination of a repeated specimen, nor, in fact, the use of more than a single test upon a given specimen. The writer knows of one case personally where a young woman pregnant through premarital intercourse with her fiancé was found to have a positive test in a neighboring state and refused a license to marry. Examination and additional blood studies indicated she was not syphilitic, but for a time she threatened suicide. Such tragedies are not out of the question and lesser ones are bound to result from false positives due to whatever cause.

An occasional individual may show a biologically false positive, sometimes with a certain test, sometimes with all tests. Many things may cause temporary false positives; such situations often require weeks of study and retesting before a satisfactory

conclusion can be reached. Even if the physician should decide a test is false, will the individual or the partner be willing or able to dismiss the thought of it? Many congenital cases adequately treated in childhood continue to carry positive bloods throughout life. A number of such positives have shown up in Selective Service examinations and, unfortunately, it has been impossible in some cases to collect medical records to tell whether the case had been adequately treated or not. A fairly large percentage of cases where treatment is started rather late continue to carry positive bloods in spite of all treatment, and so another problem is presented. In contrast to this it is entirely possible for an individual to have some blood tests negative and yet have a positive spinal fluid indicating an invasion of the nervous system.

In very few states does the premarital examination cover gonorrhea, and yet that disease is often more terrible than syphilis, being responsible as it is for much surgery, sterility, and blindness.

In more specific reference to the question as it applies to Minnesota let us look at some additional data. In Selective Service we are not permitted to give out figures as to the number of men examined, but so far as we can tell the percentage of positive bloods will not be over one per cent and the number of unknown cases discovered very much less than that. Tests made on all students of the University of Minnesota over a considerable period show only about one or two-tenths of one per cent positive. Among the great number of blood donors in this state with all bloods tested there appears to be less than one per cent positive. Possibly sixty to seventy thousand industrial workers have been tested during the past two or three years, here again so far as we can tell positives will run less than one per cent.

During the summer of 1941 when approximately 40,000 men were on maneuvers in the northern part of the state for a six-weeks period, only seven cases of gonorrhea supposedly had sources in Minnesota, but four were questionable. No syphilis was traceable to Minnesota. During the summer of 1943, when 7,000 men were at Camp Ripley for about three months, only six cases of gonorrhea were traceable to contacts in Minnesota, and no syphilis. These two records have been acknowledged as about the best in the country. None of these things just happen but are the result of a satisfactory program persistently carried out.

As stated earlier, in 1942 only 240 cases of early syphilis were recorded, and in 1943, 244 cases. These figures represent the available group from which some infectious cases might be uncovered by premarital examination, but it would be only a part of such numbers since members of this group are already being found. Of these figures in 1942 only 135 men were between twenty and forty as those most likely to marry; in 1943, 153. In 1942, 1,792 out of a total of 2,359 cases reported were congenital, old latent, or neurosyphilis and of no interest so far as such a law is concerned. An additional 296 were listed as early latent, so noninfectious. In 1943, 1,296 out of a total of 1,879 were in this group and an additional 278 were early latent and noninfectious.

It should not be taken for granted that Minnesota is without necessary laws to control venereal disease. Its original regulations have been copied by almost every state. Blood tests or other laboratory specimens can be required whenever desirable and the simple provision of its being a misdemeanor to expose another person makes it possible to handle almost any situation, even to preventing marriage in a known case.

As to prenatal blood tests, between the effect of the low rates and the fact that practically all pregnant women are already being tested there seems little need for such a law. It seems reasonable to expect our medical profession to continue to do this important work without being required by law. In 1942 our record

shows four babies born infected, and in 1943 two babies born infected. In 1942 only nine congenital cases under ten years of age were reported. In 1943 only six congenital cases under ten years of age were reported. No law requires an expectant mother to present herself for such test so there will always be an occasional one get to the doctor too late in her pregnancy for anything to be done, but records indicate congenital syphilis in Minnesota is all but wiped out.

In any state where control has been instituted only in the past few years and rates for early cases are high, such laws may be valuable and very much worth while, but in Minnesota at present it is surely questionable whether the cost of administration and the burden of enforcement are worth while. As an aid to control of venereal disease it would be nearly worthless and so far as its educational value is concerned that work is being done directly with a very complete and comprehensive program. If there is to be some such law should it not be a simple, broad one, covering a complete physical examination, and include gonorrhea, tuberculosis, or any other disease which could be transmitted by contact, as well as certain mental diseases? I believe careful consideration of these comments and data justify the conclusions.

Very truly yours,
MINNESOTA DEPARTMENT OF HEALTH
H. G. IRVINE, M.D.
Consultant in Venereal Diseases

EDITOR'S NOTE: The above communication comes from Doctor Irvine in response to an editorial entitled "Premarital and Prenatal Examinations," which appeared in our June issue, raising the question whether we were not backward in our venereal disease control program. The extent of the activities of this branch of the State Health Department is perhaps not as well known to physicians as it might be.

The advisability of a law in Minnesota making premarital and prenatal examinations compulsory apparently has its pros and cons. It has had its proponents before this and has been considered seriously by the State Health Department. The decision was made that the present publicity regarding venereal disease, free Wassermann testing, and the general practice of such testing in obstetrical patients has resulted in as few cases of congenital syphilis as would result from a compulsory law requiring such examination.

There are those who believe that the marriage contract is often entered into with too little thought, and that the requirement of a doctor's certificate of freedom from venereal disease and tuberculosis would put a brake on hasty marriages which so often end in divorce. Whether such a law, which admittedly could be quite perfunctory, is advisable for Minnesota or not, the medical profession should see to it that every pregnant woman has a blood Wassermann test and should examine for venereal and other contagious diseases in premarital examinations.

In Memoriam

FEGAR MELVIN BABCOCK

Dr. F. M. Babcock, for over twenty-five years a prominent physician of Northfield, Minnesota, passed away May 18, 1944, at the age of fifty-seven.

Dr. Babcock was born August 14, 1886, at Dundas, Minnesota. He graduated from Northfield High School in 1905, and received his B.A. in 1909, and his M.D. in 1913, from the University of Minnesota. He served as resident physician at Thomas Hospital in 1911-12, and as intern at St. Barnabas Hospital, Minneapolis, in 1913-14.

After practicing a year at Preston, Minnesota, he established himself at Northfield in 1914, in association with the late Dr. W. A. Hunt.

During World War I, he served in the medical corps and went overseas in 1919, where he was stationed at the United States Base Hospital at Le Mons until his return in July, 1919. On his return, he was again associated with Doctor Hunt until the latter's death in 1920.

Doctor Babcock was a member of the Northfield City Council for eleven years and was local surgeon for the Chicago, Milwaukee, and Saint Paul Railroad for twenty years.

He was a past master of Social Lodge, a member of the Modern Woodmen, United Workmen, and the Eagles Lodge. He was also a member of the Rice County Medical Society, the Minnesota State and American Medical Associations. Doctor Babcock is survived by his sister, Lena Babcock, with whom he made his home.

CARL FISHER

Word has been received of the death of Dr. Carl Fisher, former member of the staff of the Mayo Clinic, Rochester, which occured June 7 at Los Angeles, California.

Dr. Fisher was born July 16, 1879, at Breckenridge, Minnesota. He received the degree of B. S. in 1901 from Carleton College, Northfield, Minnesota, and of M.D. in 1905 from Harvard University. He was an intern in ophthalmology at the Massachusetts Charitable Eye and Ear Infirmary, Boston, from July, 1905, to January, 1907, and was later intern at the Carney Hospital, the Massachusetts General Hospital, and the Infants' Hospital, Boston. He entered the Mayo Clinic as head of the Section on Ophthalmology and Otology May 1, 1909, and remained until July 1, 1917. He served in the

Army of the United States from December, 1917, to August, 1919. He was commissioned lieutenant and then captain in the medical reserve corps and later became a major in the medical corps of the A.E.F., being stationed at Base Hospitals 26, 115 and 57. He was in practice at Los Angeles from March, 1921, until the time of his death, was associate professor of ophthamology at the University of Southern California School of Medicine and a member of the staff of the Good Hope Clinic, the Los Angeles Eye and Ear Hospital, St. Vincent's Hospital and the Hospital of the Good Samaritan.

He was certified as a specialist in ophthalmology in 1920 by the American Board of Ophthalmology. He was a fellow of the American College of Surgeons and a member of the American Medical Association, the Los Angeles Ophthalmological Society, the Los Angeles Clinical and Pathological Society, the American Ophthalmological Society, the American Academy of Ophthalmology and Otology and the Alumni Association of the Mayo Foundation.

FRANK HENRY HACKING

Dr. Frank Henry Hacking, a resident of Minneapolis since 1914, died June 2, 1944, in Fairview Hospital, Minneapolis.

Doctor Hacking was born February 5, 1872, at Listowel, Ontario, Canada. He attended Winnipeg High School and Manitoba Collegiate Institute at Winnipeg, from which he graduated in 1889. He received his medical degree from Rush Medical College in 1899, and interned at the Norwegian Deaconess Hospital in Chicago. He served as assistant in clinical medicine at Chicago Clinical School in 1900.

He practiced in Chicago in 1900, Wood Lake, Minnesota in 1901, and in Granite Falls from 1902 to 1913. Since 1914, he had lived in Minneapolis. While in Granite Falls, he served as secretary of the Camp Release Medical Society from 1907 to 1912, and as president in 1913.

In Minneapolis, Doctor Hacking was physician-in-charge of Thomas Hospital for tuberculosis from 1915 to 1919 and medical superintendent of Hopewell Hospital in 1919. He was an attending physician at Glen Lake Sanatorium from 1921 to 1935, and on the Federal Board of Rehabilitation and attending specialist in tuberclosis of the United States Veterans Bureau from 1919 to 1926. He was also a member of the executive committee of the Hennepin County Tuberculosis Association from 1920 to 1937 and president of the Minnesota Association for Crippled Children from 1925 to 1929. During World War I, he was acting chief-of-staff of the Minneapolis General Hospital.

Doctor Hacking was a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations, and of the Knights of Pythias.

Of General Interest

Dr. John A. Paulson of Rochester has recently been commissioned as Lieutenant (sg) in the United States Naval Reserve.

* * *

Dr. F. A. Figi of Rochester was re-elected secretary-treasurer of the American Association of Oral and Plastic Surgeons at the recent meeting held in Philadelphia.

* * *

Dr. R. M. Watson, who recently completed internship at Miller Hospital, Saint Paul, has been appointed resident head for a period of one year beginning June 1, 1944.

* * *

Dr. Philip R. Beckjord of Willmar, who enlisted in October, 1940, has been promoted to the rank of Lieutenant Colonel and is now Commanding Officer of a Medical Battalion in Texas.

* * *

Lieutenant Robert W. Merrill was at home in Morris, Minnesota, in June on leave from Hattiesburg, Mississippi, where he has been stationed. He entered the naval service in September, 1942.

Dr. Vern L. Zech, recently resident physician at Midway Hospital, Saint Paul, has joined the Ortonville Clinic, Ortonville, Minnesota, as a regular member of the staff.

* * *

Dr. Robert B. Tweedy was elected president of the Winona General Hospital staff at its annual meeting in June. Other officers named are Dr. William Heise, vice president; Dr. G. L. Loomis, secretary.

* * *

Dr. Charles Baker, son of Dr. A. C. Baker of Fergus Falls, has opened offices in Herman, Minnesota, for the practice of medicine. He will also assist with surgery at Wright Hospital in Fergus Falls four days a week.

Dr. James T. Larson has become associated in practice with Drs. Lowe, Ernest and Lowe in South Saint Paul. Dr. Larson, a graduate of the University of Minnesota medical school has been in practice for the past thirteen years.

* * *

Dr. R. B. Patterson, formerly of Brainerd, is now associated in practice with Dr. W. W. Yaeger at Marshall. Dr. Patterson, a graduate of the University of Minnesota, had been practicing in Illinois since the first of the year, when he was given a medical discharge from the Army, having served one and a half years in the Army Reserve Medical Corps.

* * *

Dr. D. E. McBroom, Superintendent of Minnesota Colony for Epileptics, Cambridge, Minnesota, has resigned his position there after many years of service to the state and has accepted the superintendency of the State School and Home for Feebleminded at Redfield, South Dakota.

* * *

Two members of the staff of the Duluth Clinic, now in service, have recently received promotions. Dr. William D. Coventry, Army Air Corps physician stationed at Mitchel Field, was promoted from Captain to Major. Dr. R. H. La Bree, serving with the station hospital at Camp Abbott, Bend, Oregon, also was promoted to Major.

* * *

Dr. F. E. Harrington of Minneapolis has accepted the superintendency of the Minneapolis General Hospital on a conditional basis for the duration of the war. Dr. Harrington retired as city health commissioner, effective June 21, 1944, but was asked to continue as superintendent of General Hospital, a position he has been filling pending the appointment of a full-time superintendent. Dr. Frank J. Hill, former North Dakota state health officer, succeeds Dr. Harrington as city health commissioner.

* * *

Dr. H. B. Aitkens of Le Center was honored at a dinner given by the community which he has served for fifty years on May 25 in the high school auditorium. He was presented with a purse to cover expenses of a trip to his native England and a plaque "In appreciation of fifty years of faithful service as family doctor in Le Center since April 9, 1894." Additional appreciation was expressed in the conferring of an honorary mem-

bership in the American Legion post and life membership in the Le Center Community Club.

Dr. Aitkens, in addition to his professional duties, has served for forty years on the local school board, having been president for more than thirty years. He is a member of the Nicollet-LeSueur County Medical Society, Southern Minnesota Medical Association, state and national medical associations, and has been active as a member of the Episcopal church. He has been examining physician for participants in four wars, having examined a Civil War veteran for pension award, in addition to inductees in the Spanish-American War, World War I and World War II.

Classified Advertising

PHYSICIAN WANTED—To assist in group practice. Fully approved and completely equipped hospital and clinic. Address D-85, care MINNESOTA MEDICINE.

OPENING FOR PHYSICIAN—Busy corner location, residence section, Minneapolis. Office over drug store. Practice established ten years. Present physician leaving to enter Navy service. Address D-87, care MINNESOTA MEDICINE.

WANTED—Secretary and technician for physicians' offices in suburbs of Twin Cities. Please give experience and training in application. Address D-91, care MINNESOTA MEDICINE.

WOMAN PHYSICIAN—Recent graduate desires position with Minneapolis doctor or clinic, part or full time. Address D-89, care MINNESOTA MEDICINE.

POSITION WANTED—As receptionist in physician's office. Experienced in bookkeeping, typing and general office work. Telephone Emerson 8763 or Emerson 6607.

FOR SALE—Splendid opportunity for physician and surgeon. Excellent practice and 14-bed hospital with modern equipment. Hospital may be rented. Thriving community 45 miles from Minneapolis. Address D-88, care MINNESOTA MEDICINE.

FOR SALE—Combination office and home. Modern, city heat, and gas. Town of 1800, forty miles south of Twin Cities. Modern hospital, schools, and church. Possession, September 15. Address D-90, care MINNESOTA MEDICINE.

FOR SALE—Unopposed practice in southwestern Minnesota with large surrounding territory. Open hospital, 7 miles on good roads. Price of equipment only and very easy terms. Address D-92, care MINNESOTA MEDICINE.